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U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF ANIMAL INDUSTRY.

TENTH AND ELEVENTH ANNUAL REPORTS

OF THE

BUREAU OF ANIMAL INDUSTRY

FOR

THE YEARS 1893 AND 1894.

WASHINGTON:
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1896.

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AN ACT providing for the public printing and binding and the distribution of public documents.

SEC. 73. Extra copies of documents and reports shall be printed promptly when the same shall be ready for publication, and shall be bound in paper or cloth, as directed by the Joint Committee on Printing, and shall be of the number following, in addition to the usual number:

* * * * * * *

Of the Report of the Bureau of Animal Industry, thirty thousand copies, of which seven thousand shall be for the Senate, fourteen thousand for the House, and nine thousand for distribution by the Agricultural Department.

92109

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., January 7, 1896.

SIR: I have the honor to transmit herewith the Tenth and Eleventh Annual Reports of the Bureau of Animal Industry, prepared in accordance with section 1 of the act of Congress approved May 29, 1884, which provides that it shall be the duty of the chief of this Bureau "to investigate and report upon the condition of domestic animals of the United States, their protection and use, and also inquire into and report the causes of contagious, infectious, and communicable diseases among them, and the means for the prevention and cure of the same, and to collect such information on these subjects as shall be valuable to the agricultural and commercial interests of the country." The printing of this report is provided for in section 73 of "An act providing for the public printing and binding and the distribution of public documents," approved January 12, 1895.

It was my intention to include in this report the bulletins on investigations of subjects of general interest which had been published in pamphlet form during the years covered by this volume. These have been withdrawn, however, in accordance with a ruling of the Department that matter already in bulletin form should not be included. It was then too late for the preparation of new articles which might be substituted for those withdrawn.

While this report contains an account of the more important operations of the Bureau of Animal Industry for the years 1893 and 1894, the scientific investigations are not recorded herein, as the results of these have already been published in the bulletins which have been issued from time to time as material became available.

As papers of great interest and importance from their bearing on agriculture and commerce, I mention especially one on anthrax as it exists in the United States, in South Africa, in Australia, and in Great Britain, together with the results of efforts for its prevention in Australia by means of Pasteur's method of vaccination.

There is also a paper on the extirpation of the disease of horses known as maladie du coït, a work of great value, accomplished under the direction of this Bureau. The prevalence of tuberculosis among dairy cattle

in the State of New York is discussed by Dr. E. C. Schroeder from the standpoint of personal observation. The injuries caused in cattle by pointed objects which have been swallowed, and the preliminary investigations of an unknown disease in turkeys, will be of much assistance to the intelligent farmers who read them. There have, also, been included two brief articles of a popular character on black quarter and actinomycosis—subjects concerning which many inquiries are addressed to the Department. The compilation of the laws of the various States and Territories for the control of contagious animal diseases furnishes essential information to shippers of stock from one State into another, and to the legislators of any one State who desire to profit by the laws on this subject which have been enacted and tested in our States.

I recommend that the report outlined above be forwarded to the Public Printer for publication.

Very respectfully,

D. E. SALMON,
Chief of Bureau of Animal Industry.

To Hon. J. STERLING MORTON,
Secretary of Agriculture.

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TENTH AND ELEVENTH ANNUAL REPORTS OF THE BUREAU OF ANIMAL INDUSTRY.

REPORT OF THE CHIEF OF THE BUREAU.

TRANSACTIONS OF THE BUREAU FOR 1893.

There has been great activity during the year in the various lines of work conducted by this Bureau, and considerable modification has been made in the direction and disposition of the force in the field, which will be referred to in the enumeration of the various details which are necessary to an understanding of the subject. Notwithstanding the large force of employees and the considerable expenditures of money, the field of work which Congress has committed to the Bureau of Animal Industry has only been entered upon, and a much greater development and extension is required before the objects of the statutes are fully complied with. It will be the aim of this report to indicate the more important things which should be done in accordance with existing laws, as well as to state what has been done during the fiscal year ended June 30, 1893.

ERADICATION AND CONTROL OF CONTAGIOUS DISEASES.

The suppression and extirpation of contagious, infectious, and communicable diseases of animals, and more particularly of the contagious pleuro-pneumonia of cattle, was the most prominent object indicated by the organic act for the establishment of the Bureau. Other duties have since been added, as, for example, the inspection of live animals for export, and the inspection of meat for the interstate and export trade, but the value of these new fields of work should not lead to neglect or to a lack of appreciation of the subjects which were at first considered of paramount importance.

A number of contagious diseases still exist in the United States, which cause heavy losses to stock owners, and which we have not yet attempted to suppress or extirpate. Tuberculosis, the most widespread of animal plagues, is attracting more and more attention each year, because of its ravages among animals and its danger to human health and life. Hog cholera is disseminated to all parts of the country by infected cars or by hogs which have been unloaded in infected yards, and have contracted the disease by such exposure. Glanders in horses is controlled in a few of our States only, and eradicated in none. All of these maladies deserve attention, both because of the direct losses resulting from them and the danger to the public health which is inseparable from their existence.

CONTAGIOUS PLEURO-PNEUMONIA.

The work for the eradication of contagious pleuro-pneumonia, which has been crowned with complete success, demonstrates what may be accomplished in this direction by the National Government for the stock interests of the country. This disease, which was introduced into the United States half a century ago and allowed to spread until 11 States had been infected and the entire cattle interest had been endangered, has been completely extirpated, and no case of it has been discovered since March 25, 1892.

The difficulty of ascertaining definitely that no contagion exists in a district once infected has led to the expression of doubt from some sources as to the correctness of the conclusion that the disease has been thoroughly and completely eradicated. These objections were, however, anticipated, and precautions were taken which should inspire the utmost confidence. It was the policy of the Bureau to keep up the inspection and quarantine regulations in infected districts for six months after the discovery of the last case of the disease before declaring the plague eradicated, and to continue the inspection another six months before withdrawing the inspectors from the district. The inspection was, therefore, maintained in the counties of Essex and Hudson, in the State of New Jersey, and Kings and Queens counties, in the State of New York, until April 1, 1893. The period of one year after the last case of disease expired on the 25th of March, 1893, and the entire force engaged in this inspection was dismissed at the end of that month.

In addition to the work of the special inspectors engaged in the search for pleuro-pneumonia, the Bureau has another means of discovering the existence of such a disease—in the meat-inspection service, now in operation at the principal abattoirs of the United States. During the past year nearly 4,000,000 head of cattle were examined at the time of slaughter, and post-mortem examinations were made by veterinarians. Such a disease as pleuro-pneumonia could not exist among such cattle in the United States without attracting the attention of these inspectors. In not a single instance, however, have the reports shown the discovery of lesions such as indicate either the acute or chronic stage of this disease.

A private inquiry has been recently made by Dr. John W. Gadsden, a distinguished veterinarian of Philadelphia, through the members of the veterinary profession in the United States, to determine if any members of this profession had cognizance of the existence of pleuro-pneumonia. In a paper read before the International Veterinary Congress at Chicago in October, 1893, Dr. Gadsden stated that he could obtain no trace of the disease in the United States, and that he was convinced of its complete eradication.

More satisfactory evidence than this it is impossible to procure in any country or under any conditions. The local authorities of the various sections of the country have recognized this, and have withdrawn the prohibitions placed for so long a time on cattle from districts that were once known to be infected. The only injurious effects which remain as a legacy from the period of infection are found in the Canadian quarantine of ninety days and the British restrictions on the landing of live cattle of American origin, which are still enforced. There are no indications of the length of time which the British Government will consider it necessary to maintain restrictions after it has been

officially notified that such regulations are no longer necessary; but it is hoped that the prevailing views of the British people in favor of an unrestricted international trade will eventually lead to the withdrawal of a prohibition which is as inconsistent with existing facts as with these professions of principle.

TEXAS FEVER.

This disease, which is caused by infection disseminated by cattle not from Texas alone, but from other States adjacent to the Gulf Coast and South Atlantic Seaboard, is now so well understood through the investigations of this Bureau that its prevention, except in isolated cases, is easily effected. The regulations for this purpose are designed with a view of (1) defining the infected district, (2) keeping the cattle originating in this district from coming into contact with cattle from other sections of the country, and (3) disinfecting cars and pens which are likely to be used for susceptible cattle.

The knowledge of the exact limits of the infected area is still somewhat imperfect, as it can be derived only from observations of the results of shipping cattle which afterwards come into contact with susceptible animals under conditions proper for the transmission of the infectious agent. The definition of the infected district, which we already know is very nearly correct, is therefore experimentally changed from year to year to a slight extent, in accordance with the results of the experience of the preceding year. In this way restrictions have been removed from a considerable district which was at first supposed to be dangerous, but which is now known to be safe.

The following is the full text of the regulations for the year 1893, as issued by the then Secretary of Agriculture, Hon. J. M. Rusk, under date of February 15, 1893:

To the managers and agents of railroad and transportation companies of the United States, stockmen, and others:

In accordance with section 7 of the act of Congress approved May 29, 1884, entitled "An act for the establishment of a Bureau of Animal Industry, to prevent the exportation of diseased cattle, and to provide means for the suppression and extirpation of pleuro-pneumonia and other contagious diseases among domestic animals," and of the act of Congress approved July 5, 1892, making appropriation for the Department of Agriculture for the fiscal year ending June 30, 1893, you are hereby notified that a contagious and infectious disease known as splenetic or southern fever exists among cattle in the following-described area of the United States:

All that country lying east and south of a line commencing at the southwest corner of the county of Pecos, State of Texas, on the Rio Grande River; thence following the western boundary of Pecos County to the southeast corner of Reeves County; thence following the boundary line between the counties of Pecos and Reeves to the Pecos River; thence southeasterly following the said Pecos River to the northwest corner of Crockett County; thence easterly along the northern boundaries of Crockett and Schleicher counties to the southeastern corner of Irion County; thence northerly along the eastern boundary of Irion County to the northeast corner of said county; thence northerly to the southern boundary of Coke County; thence westerly to the southwestern corner of Coke County; thence northerly along the western boundary of Coke County to the southern boundary of Mitchell County; thence easterly to the southeast corner of Mitchell County, and thence northerly along the western boundaries of Noland and Fisher counties to the southern boundary of Kent County; thence easterly along the southern boundary of Kent County to the southwestern corner of Stonewall County; thence northerly along the western boundary of Stonewall County to the southeastern corner of Dickens County; thence easterly along the northern boundary of Stonewall County, to the southwestern corner of Knox County; thence northerly along the western boundaries of Knox and Hardeman counties to the Red River; thence northwesterly following the Red River to its point of intersection with the one hundredth meridian of longitude; thence northerly from said point of intersection along said one hundredth meridian to the southern

boundary of the State of Kansas; thence easterly along the southern boundary of the State of Kansas to the northeast corner of the Indian Territory; thence southerly along the eastern boundary of the Indian Territory to the southwest corner of the State of Missouri; thence easterly along the southern boundary of the State of Missouri to the Mississippi River; thence running southerly along the Mississippi River to the southwestern corner of the county of Lauderdale, State of Tennessee; thence running easterly following the southern boundaries of the counties of Lauderdale, Crockett, Gibson, Carroll, Benton, Perry, Lewis, Maurey, Marshall, Bedford, Coffee, Grundy, and Sequatchie to the southwest corner of Hamilton County; thence northerly along the boundary line between the counties of Sequatchie and Hamilton to the southwest corner of Rhea County; thence easterly along the southern boundaries of the counties of Rhea, Meigs, McMinn, and Monroe, State of Tennessee, to the eastern boundary of said State; thence following the northern boundaries of the counties of Cherokee, Macon, Jackson, Transylvania, and Henderson, State of North Carolina, to the southeast corner of the county of Buncombe, of said State; thence in a northeasterly direction following the Blue Ridge Mountains to the southwestern corner of the county of Amherst, State of Virginia; thence southeasterly along the southern boundary of the county of Amherst to the western boundary of the county of Appomattox; thence northeasterly along the eastern boundaries of the counties of Amherst, Nelson, and Albemarle to the southern boundary of the county of Orange; thence along the southern boundary of the county of Orange to the boundary line of the county of Spottsylvania; thence along the eastern boundary of the county of Orange to the southern boundary of the county of Culpeper; thence easterly along the southern boundaries of the counties of Culpeper and Stafford to the boundary of King George County; thence northerly along the eastern boundary of Stafford County to the Potomac River; thence following the Potomac River southerly to the Chesapeake Bay; thence easterly along the southern boundary of the State of Maryland to the Atlantic Ocean.

From the 15th day of February to the 1st day of December, 1893, no cattle are to be transported from said area to any portion of the United States north or west of the above-described line, except by rail for immediate slaughter, and when so transported the following arrangements must be observed:

(1) When any cattle in course of transportation from said area are unloaded north or west of this line to be fed or watered, the places where said cattle are to be so fed or watered shall be set apart and no other cattle shall be admitted thereto.

(2) On unloading said cattle at their points of destination, pens shall be set apart to receive them, and no other cattle shall be admitted to said pens; and the regulations relating to the movement of Texas cattle, prescribed by the cattle sanitary officers of the State where unloaded, shall be carefully observed. The cars that have carried said stock shall be cleansed and disinfected before they are again used to transport, store, or shelter animals or merchandise.

(3) All cars carrying cattle from said area shall bear placards stating that said cars contain Southern cattle, and each of the waybills of said shipments shall have a note upon its face with a similar statement. Whenever any cattle have come from said area and shall be reshipped from any point at which they have been unloaded to other points of destination, the cars carrying said animals shall bear similar placards with like statements, and the way bills be so stamped. At whatever point these cattle are unloaded they shall be placed in separate pens, to which no other cattle shall be admitted.

(4) The cars used to transport such animals, and the pens in which they are fed and watered, and the pens set apart for their reception at points of destination, shall be disinfected in the following manner:

(*a*) Remove all litter and manure. This litter and manure may be disinfected by mixing it with lime or diluted sulphuric acid, or, if not disinfected, it may be stored where no cattle can come into contact with it until after December 1.

(*b*) Wash the cars and the feeding and watering troughs with water until clean.

(*c*) Saturate the walls and floors of the cars and fencing, troughs and shutes of the pens with a solution made by dissolving 4 ounces of chloride of lime to each gallon of water. Or disinfect the cars with a jet of steam under a pressure of not less than 50 pounds to the square inch.

(5) It is further expressly provided that cattle which have been at least ninety days in the counties of Coke, Nolan, Fisher, Stonewall, Haskell, Knox, and Hardeman, State of Texas, which lie within the above described area, may be moved from said counties by rail into the States of Colorado, Wyoming, Montana, and South Dakota, in accordance with the regulations made by said States for the admission of Southern cattle thereto: *Provided*—

(1) That cattle from said area shall go into said States only for slaughter or grazing, and shall on no account be shipped from said States into any other State or Territory of the United States before the 1st day of December, 1893.

(2) That such cattle shall not be allowed in pens or on trails or on ranges that are

to be occupied or crossed by cattle going to the Eastern markets before December 1, 1893, and that these two classes of cattle shall not be allowed to come into contact.

(3) That all cars which have carried cattle from said area shall, upon unloading, at once be cleaned and disinfected in the manner provided by these regulations.

(4) That the State authorities of the States of Colorado, Wyoming, Montana, and South Dakota agree to enforce these provisions.

The losses resulting yearly to the owners of susceptible cattle, both in the interstate and export trade, by the contraction of this disease from exposure in unclean and infected cars and pens, and by means of the manure carried in unclean cars from place to place, have become a matter of grave and serious concern to the cattle industry of the United States. It is absolutely essential, therefore, that this cattle industry should be protected as far as possible by separating the dangerous cattle and by the adoption of efficient methods of disinfection.

Inspectors will be instructed to see that disinfection is properly done, and it is expected that transportation companies will promptly put into operation the above methods.

The following supplementary regulation was subsequently issued under date March 13, 1893:

Notice is hereby given that the regulations of the Department of Agriculture, dated February 15, 1893, concerning cattle transportation, are modified so as to permit cattle that have been in the counties of Wilbarger, Baylor, Throckmorton, Shackelford, Jones, and Pecos, State of Texas, since January 1, 1893, and have not come into contact with any cattle brought into said counties from other counties in the infected district since said date, to be moved from the said counties by rail into the States of Colorado, Wyoming, Montana, North Dakota, and South Dakota, in accordance with the regulations made by said States for the admission of Southern cattle thereto: *Provided*—

(1) That a permit shall first be obtained from the Secretary of Agriculture for such movement. The application for said permit must state the name of the county in which said cattle are located, the name of the owner of said cattle, the number of cattle to be moved, and the route over which said cattle are to be transported to the above-named States.

(2) That said permit shall be forwarded to the inspector of the Department stationed at Kansas City, Mo., who will detail an officer to inspect said cattle and ascertain whether they are entitled to be shipped under the provisions of this order, and who, upon finding that the same are so entitled, will countersign said permit and supervise the movement of said cattle to the point of shipment. The said officer, before delivering such permit, shall obtain affidavits of the owner or manager of the cattle and of two reputable and disinterested persons showing that they are acquainted with the cattle sought to be shipped, and that they have known said cattle since the 1st day of January, 1893, and that said cattle have been kept in the territory described above and have not come into contact with any other Southern cattle. These affidavits will be forwarded by him to the Department of Agriculture.

It is further ordered that the second proviso of the fifth rule of the regulations of February 15, 1893, providing that cattle moved into the above-named States under said rule shall not be allowed in pens or on trails or on ranges that are to be occupied or crossed by cattle going to the Eastern markets before December 1, 1893, and that these two classes of cattle shall not be allowed to come into contact, is hereby rescinded.

This was followed, May 19, by a further modification, as follows:

Notice is hereby given that the regulations of the United States Department of Agriculture, of date February 15, 1893, concerning cattle transportation, are modified so as to permit cattle that have been in the counties of Cherokee, Clay, Macon, Jackson, and Transylvania, State of North Carolina, since the 1st day of January, 1893, and have not come into contact with any cattle brought into said counties from other counties in the infected area described in said regulations since said date, to be moved from the said counties by rail into the States of Kentucky, Tennessee, and Virginia for grazing purposes, in accordance with the regulations made by said States for the admission of Southern cattle thereto.

Again, August 30, the following notice was issued:

Notice is hereby given that the regulations of the United States Department of Agriculture, of date February 15, 1893, concerning cattle transportation are modified, from and after September 1, 1893, so as to exclude the counties of Benton, Washington, Carroll, Madison, Boone, Newton, Marion, Searcy, Baxter, Stone, Fulton, Izard, Sharp, Independence, Lawrence, Randolph, Greene, and Clay, in the State of Arkansas, from

the infected area described in said regulations, and the quarantine line established by said regulations is hereby changed so as to place these counties north of said line: *Provided*, That nothing in this order is to be construed to interfere with the regulations of any State affecting the movement of cattle from this portion of the State of Arkansas.

The efforts of the Bureau in maintaining these regulations and in preventing the dissemination of the disease have been very successful. The large stock yards of the country have been kept free from infection, and no reports of losses of any great magnitude from the ravages of this disease have been made to the Department. There have been, however, a number of small outbreaks, due to violations of the regulations or to the necessary driving of cattle intended for slaughter from the railroads and stock yards to the abattoirs. The roads upon which such cattle are driven become infected, and native cattle allowed to travel over them frequently contract the disease. On account of the large interests involved it would not be advisable to stop the driving of Southern cattle to slaughterhouses, particularly as the owners of susceptible cattle have it in their power to guard against the disease by keeping their animals upon their own premises. The animals affected are usually cows which are allowed to run at large in the suburbs of the large cities.

It is to be regretted, however, that there have been some violations of the regulations by railroad companies, which have been followed by the appearance of the disease in various States and also in several shiploads of cattle consigned to foreign ports. The effects of these violations of the regulations are very serious, not only in the direct losses of cattle caused by the disease, but in the unfavorable influence on the export trade and upon the restrictions enforced by other countries. In general, transportation companies have cheerfully and efficiently cooperated with this Bureau by giving stringent orders to their employees to comply with the regulations. In a few cases, however, there has been a disposition to evade the requirements, which, if persisted in, should be met with prosecution in the courts, or, if this fails, by legislation providing that cars for carrying infected cattle should be painted a distinctive color and used for that purpose only.

The publication of the special report of this Bureau on the nature and causation of Texas fever has led to experiments being made in various parts of the country with a view to destroying the ticks which act as bearers of the contagion, and thus rendering the Southern cattle harmless. The chief difficulties have been to discover some substance or compound that could be applied to the infected cattle and which would destroy the ticks without injuring the animals or involving too much expense.

Mr. R. J. Kleberg, secretary of the Texas Live Stock Sanitary Commission, has used a mixture which he believes to be effectual and the cost of which is only about 1 cent per animal. He has also invented a dipping tank to contain the mixture into which the cattle are plunged from an automatic trap door in such a manner that they are completely submerged. He estimates that 2,000 head of cattle may be passed through one of these tanks in a day.

The importance of this invention, if experience should confirm the conclusions from the tests so far made, would certainly be very great. It may possibly lead to the disinfection of all of the cattle from the infected district, and thus do away with the separate pens now maintained at the leading stock yards, which have been the cause of more or less dissatisfaction but which have been necessary to prevent the spread

of the disease. Such a change would simplify the regulations, make the prevention more nearly absolute, and would save the annoyance and loss of which shippers from the infected district now complain on account of discriminations made by buyers against cattle from the quarantine pens.

Experiments to test this method will be made during the summer of 1894 on a plan which it is hoped will give decisive results. The dipping tank appears to work very satisfactorily, and there can scarcely be a doubt as to the possibility of passing the animals through it with the necessary facility and rapidity. The only question is as to the efficiency of the mixture which is used for killing the ticks. These parasites have great powers of resistance, and in our experiments at the Bureau laboratory they have not been killed by chemical agents of various kinds, even when far too concentrated to be applied to the bodies of cattle.

MALADIE DU COÏT.

This exotic disease, which has been known in Europe since 1796, was first discovered in the United States in 1884. It was doubtless introduced with some of the horses imported for breeding purposes, and its nature not being at first recognized its dissemination occurred before attention was attracted to it. A considerable number of animals were found to be infected in Illinois, and the danger to the horse industry was such that the disease was eradicated through the efforts of the State authorities.

At that time there were rumors of the existence of the disease in other States, but if it existed elsewhere the affected animals were not located and interest in the subject soon subsided.

In 1892 this Bureau was informed of a disease affecting breeding horses in northwestern Nebraska, which had the general characters of maladie du coït. Dr. George C. Faville was detailed to make an investigation, and after examining a considerable number of animals reported that this disease existed there and that probably 200 horses were infected.

No steps were taken for the eradication of the malady until June 12, 1893, when Dr. Faville was again ordered to Nebraska with instructions from the Secretary of Agriculture to cooperate with Mr. Edward Shelden, agent of the Bureau of Animal Industry, for the purchase and destruction of all affected animals. It was found that a large number of the diseased animals discovered by the investigation of 1892 had since died, and the horse owners of the infected section had taken precautions which had to a large extent prevented the further dissemination of the contagion. Thirty-two diseased animals were found in Nebraska and five in South Dakota. These were all purchased and killed.

The expense of eradicating this disease in the States mentioned, including the salaries and traveling expenses for the time the animals were being searched out, was as follows:

Salaries	$2,512.42
Traveling expenses	1,096.12
Cost of horses (37)	1,624.00
Total	5,232.54

This disease is incurable by any method of treatment now known, although a small proportion of the affected animals recover without treatment. The course of the malady is slow, and, although it at first appears as a local affection, it becomes generalized after a few weeks or months, and animals may live for three or four years, being capable of

disseminating the contagion during all this time. It is, consequently, necessary to destroy affected animals in order to eradicate the disease. In doing this, compensation must be paid, as affected horses are in most cases capable of doing some work, and unless they are bred there is no danger to other animals from them. It is this chance of their being bred, either by the present or some subsequent owner, which makes it essential that they should be destroyed.

The disease is one which rapidly spreads among breeding stock, and in some cases is so mild that no symptoms can be discovered except upon the most careful examination by a veterinarian. A stallion affected in this mild form may be purchased by a person who has not the slightest idea that the animal is unsound, and the result is the infection of a large number of mares before anyone in the locality suspects that the deadly contagion has been introduced.

The existence of this disease in the United States is a great menace to the horse industry. If permitted to spread over a large territory, it will be very difficult to eradicate it, and the work will require much time and a large expenditure of money. Eradication wherever it is discovered is therefore very important.

The extirpation of this disease in Nebraska removes the danger from that outbreak, but it is possible that affected animals still exist in the country, and horse owners should be on their guard. A disease so fatal, and one which is exotic and so easily extirpated, should not be allowed to remain on our soil. But owners of diseased horses do not report its presence in their animals. On the contrary, some of them conceal it and allow their animals to communicate it to others. With such a lack of public spirit among citizens, the complete extermination of the disease may require considerable time, but if stamped out wherever found it will eventually entirely disappear.

TUBERCULOSIS.

Although tuberculosis is undoubtedly a contagious disease, and is spread from one State to another by the shipment of affected animals, this Bureau has not undertaken to control or eradicate it. The general distribution of the disease, the number and the value of the animals infected, and the large force of inspectors that would be required, have made it evident that careful deliberation should be given to the subject, as the work, when undertaken, will involve great expense.

Preliminary investigations have been undertaken for determining, more accurately than is now known, the proportion of animals affected, the best means of detecting the disease, and the most practicable measures for its prevention and eradication. Tuberculin is being made in the laboratory of the Bureau and is distributed to State authorities having jurisdiction over the diseases of animals, as a means of cooperating with them. This chemical substance, which is produced during the growth of the bacillus in suitable liquids, is of inestimable value in detecting the disease, since, when injected under the skin in proper doses, it causes the temperature to rise from 2° to 5° F., while in healthy animals no such effect is produced.

Heretofore all of the tuberculin to be obtained in this country was imported from Europe and sold at prices which greatly restricted its use. There is now great demand for it, but the facilities of the Bureau have hardly been sufficient to supply the local authorities who have been using it. Public interest in the question of limiting the prevalence of tuberculosis is rapidly increasing and one State after another

is taking up the work. It is probable, therefore, that preparations must soon be made for preparing tuberculin in much larger quantities than heretofore. This will require an increase in the expenditures for the laboratory, but there certainly is no other way in which such valuable assistance and cooperation can be given to local authorities with the same expense.

Tuberculosis considered as a disease of the domesticated animals is, on account of the frequency of its occurrence and the losses which it causes, the most important of any with which we have to deal. It therefore demands attention from an economic point of view. In addition to this, however, it is one of the most frequent and fatal diseases of mankind, and may be communicated from animals to people who consume tubercular meat and milk. There is, consequently, every reason why this Bureau, which is charged with the duty of cooperating with the State authorities to prevent the spread of communicable diseases of animals from one State to another, should do what is possible to limit the spread of tuberculosis.

Investigations have been made and are being continued to determine the frequency with which the bacillus of this disease is to be found in the milk from tuberculous cows. These investigations, so far as they have gone, indicate that the danger to the public health from this source is not so great as has been supposed by some authorities. That there is some danger, however, is evident from researches which have already been made by other investigators. No doubt the presence of the bacillus in the milk depends upon whether the development of tubercles has invaded the mammary glands. The questions connected with this aspect of the subject are of such vital importance that they should be decided at an early day, and the danger may in the meantime be avoided by pasteurizing the milk before it is used.

The danger of communicating tuberculosis to man through infected meat is not so great as through infected milk. Meat is generally eaten cooked, and is as a rule raised to a sufficient temperature to destroy the vitality of the bacilli. The meat inspection now applied by this Bureau to carcasses slaughtered for the interstate and foreign trade is an additional protection of much value.

It has recently been asserted that the meat and milk of tuberculous animals contain a sufficient quantity of tuberculin to make them especially dangerous articles of food for people already affected with tuberculosis. This assertion, extremely alarming to the large number of people who are more or less affected with the disease, is based on the known fact that tuberculin is produced during the multiplication of the bacillus, and when introduced into the tissues of an affected person in sufficient quantity it causes an access of fever, which is probably accompanied by a temporary increase in the development of the germs. These facts, however, do not warrant the conclusion just mentioned, which has been drawn from them. It is extremely doubtful if tuberculin exists at any one time in the tissues or in the milk in sufficient quantity to affect the persons consuming these articles of food. It is equally doubtful if it would produce its characteristic effects when taken into the stomach of the consumer, even if it should exist in the food to such an extent that the consumer of these articles would receive a full dose in the amount of food consumed at one time. Tuberculin, to produce its characteristic effect, must be injected hypodermically into the tissues. When it is administered by the stomach we have good reason to believe that it is decomposed by the digestive

processes, either partially or completely, and that, consequently, its ingestion is not accompanied by the danger which has been attributed to it.

There is already enough alarm felt in connection with the danger of consuming the products of tuberculous animals without unduly magnifying the results which may follow to the helpless consumer. So far from sharing the view alluded to above, the writer is of the opinion that it is perfectly safe to consume the carcasses of animals which are only slightly affected and which are in a satisfactory condition of flesh. The emaciated carcasses of tuberculous cattle should under all circumstances be condemned, as well as all carcasses in which there is any considerable development of the tubercular process. But when, as is very frequently the case with animals slaughtered on the tuberculin test, there is only an insignificant lesion in one of the lymphatic glands and the animal is fat, free from fever, and shows the general signs of good health, the quality of the meat is not affected, and it may be consumed with perfect safety. The demand for the condemnation of these carcasses is based upon sentiment, not upon reason; and it is the duty of the scientist to advise against such useless destruction of food products, the wholesomeness of which has not been impaired.

GLANDERS.

Glanders is a contagious and incurable disease of horses, more widespread than is generally supposed. It is also communicated to man from affected horses, and is then nearly always fatal in its results. This disease has been allowed to spread without adequate efforts for its control, until it can now be found in nearly every city of any considerable size and in many country districts. The greatest obstacle to its eradication heretofore existing was the difficulty of making a positive diagnosis in many suspected animals. With many affected horses the symptoms are obscure and indefinite, but the power to communicate the disease is just as marked as with those having the most apparent symptoms.

Fortunately, it has been shown by recent researches that the bacillus of glanders produces a substance during its growth in culture liquids similar to the tuberculin produced by the bacillus of tuberculosis, and that this substance, which is called mallein, may be used for the diagnosis of glanders in the same manner as tuberculin is used for the diagnosis of tuberculosis. The greatest problem connected with the control of glanders is therefore solved, and the question is no longer one of possibility but of expediency.

In order to assist State authorities in this work, mallein is prepared at the laboratory of the Bureau and is supplied to them without expense. Occasionally a veterinarian is detailed to conduct the test and decide doubtful cases, but the number of veterinarians available for such work on the force of the Bureau is so small that it is impossible to respond to all requests from local authorities for such assistance. It is evident that more vigorous efforts should be made to eradicate this dangerous and destructive disease. The losses from it each year must be enormous, but it is impossible to obtain any general statistics. The danger to mankind is also considerable, and every year cases are recorded of its transmission to attendants of diseased horses or to unsuspecting persons, who have received the virus in the eye, nose, or mouth as it has been blown from the nostrils of some horse they have passed on the streets.

We know now that glanders arises from contagion only, and that it may, consequently, be stamped out, as pleuro-pneumonia has been, by the judicious application of veterinary sanitary measures. Efforts for its suppression are all the more indicated in this time of depression in the horse industry, when the losses from the malady are severely felt, and when the compensation for condemned animals would be less than under ordinary conditions.

INSPECTION OF ANIMALS IN TRANSIT.

The inspection of animals which are in course of transportation from one State into another or into foreign countries, or which have been imported from foreign countries into the United States, has been maintained. The object of this is to prevent the dissemination of the diseases of cattle which already exist in the United States, to prevent the introduction of contagious diseases with imported animals, and to enable our inspectors to certify to the healthfulness of exported animals. The number of animals, mostly horned cattle, which must be inspected for these purposes is very large, and the work is arduous and exacting.

INSPECTION OF SOUTHERN CATTLE.

During the quarantine season from February 15 to December 1, 1893, the inspectors of this Bureau inspected 64,184 carloads of cattle from the infected district. These cars contained 1,737,380 head of cattle, which were placed in the quarantine pens and kept separate from susceptible animals. Of these cattle 20,075 carloads were in transit for points beyond the first stock yards where they were examined. In all of these cases the cars and waybills were marked and the inspectors at the other cities were notified, in order that there might be a supervision of their movement until their destination was reached.

The cleaning and disinfection of the cars in which infected cattle have been shipped is performed under the supervision of the Bureau inspectors. During the season of 1893 they reported the disinfection of 56,406 cars.

In addition to the supervision of such cattle moved by rail for slaughter, there were inspected 248,230 head of cattle shipped or driven from Texas for grazing purposes. Of these, 4,182 were from the infected area, and were held in quarantine until they could be safely moved. It was also necessary to intercept and quarantine 42,500 other cattle which the owners were attempting to drive across the quarantine line in violation of the regulations.

It will be seen from this statement of the work accomplished that the prevention of Texas fever involves a service of considerable magnitude, and one that is distributed over a very large territory.

INSPECTION OF IMPORT ANIMALS.

The inspection of animals imported into the United States has been continued under the act of Congress approved August 30, 1890. On account of the official announcement by the Government of Great Britain that cattle imported into that country from Canada were found affected with contagious pleuro-pneumonia, this Department issued an order on February 3, 1893, requiring that all cattle imported into the United States from Canada should be retained in quarantine for a period of ninety days. The total number of animals arriving from Canada inspected by this Bureau at the time of importation was

462,092. Of these, 445,507 were sheep, 577 were cattle, and 16,008 were swine. The quarantine stations established at the ports of New York, Boston, and Baltimore for the reception of animals imported from countries not on the American Continent were maintained during the year under the regulations which have been enforced for a number of years. The total number of animals quarantined at these stations was 1,297, of which 77 were cattle, 1,189 were sheep, 24 were swine, and 7 were trained animals. No cases of contagious diseases were found among the imported animals during the year. Attention is again called to the fact that no legislation has been enacted which provides for the inspection of horses imported into the United States. These animals are subject to several very dangerous contagious diseases, which may, at any time, be introduced with them. Already one disease, known as "dourine," or "maladie du coït," which is not indigenous to this country, has been introduced by horses, and this Department deemed the matter of such importance that measures were taken, at considerable cost, for eradicating it.

INSPECTION OF EXPORT CATTLE.

The inspection of cattle for export has been continued during the year under the provisions of the act of Congress approved August 30, 1890. The total number of inspections made during the fiscal year ended June 30, 1893, was 611,542. This number includes reinspections at ports of export of cattle previously inspected at the interior stock yards. The total number of cattle tagged for export was 289,240. Of the total number of cattle examined 292 were rejected for various causes as not being in proper condition for shipment abroad. The exports of live cattle were about 100,000 head, or 25¾ per cent less than the preceding year. The falling off occurred during the last half of the year, as the first two quarters showed a slight increase. This loss of trade appears to have been the result of an increase in the cost of export cattle in the American market, which amounted to from 80 cents to $1 per 100 pounds.

VESSEL INSPECTION.

The inspection of vessels has been continued in accordance with the regulations prescribed under the act of Congress approved March 3, 1891, for the safe transport and humane treatment of cattle in their voyage across the Atlantic. The total number of vessels inspected was 696, of which 282 sailed from the port of New York, 209 from Boston, 1 from Portland, 13 from Newport News, 69 from Philadelphia, 6 from Norfolk and 116 from Baltimore. Of 294,002 head of cattle landed in Great Britain during the fiscal year the losses at sea amounted to but 1,377, being 0.47 per cent, or less than one-half of 1 per cent. The loss for 1892 was seven-eighths of 1 per cent, and for 1891 it was 1⅗ per cent. There has consequently been a continuous diminution of losses at sea as a result of the enforcement of the regulations of this Department. The regulations bearing upon this are the Texas fever regulations, which prevent the infection of export cattle with this disease; the inspection of export cattle, which prevents diseased animals from being exported, and the vessel inspection, which secures proper ventilation, strong and properly constructed fittings for the ships, and good attendance. One of the largest exporters recently informed the writer that whereas, before the enforcement of these regulations, he had paid as high as 8 per cent on the value of the export animals for insurance, he had just made a contract with an insurance company insuring his export cattle for this year for three-fourths of 1 per cent on the value.

INSPECTION OF AMERICAN CATTLE IN GREAT BRITAIN.

This Bureau has continued the inspection of American cattle landed at the foreign animal wharves in Great Britain during the last fiscal year. The object of this inspection is to learn the condition in which our cattle arrive, the extent of the losses at sea, and to determine whether the lung disease with which some of these animals have been found affected by the British inspectors was really contagious pleuro-pneumonia as alleged. Without such an inspection we would have no means of determining the beneficial effects of the various regulations for preventing disease and losses at sea among export cattle. During the year 54 animals found among American export cattle have been reported by the British veterinarians as being affected with contagious pleuro-pneumonia. Our inspectors in Great Britain have examined the lungs which were produced as evidence of this disease, and have in each instance pronounced the diagnosis incorrect, and declared that the animals were affected with the noncontagious forms of pneumonia which arise from exposure during the voyage. The history of these animals, however, has been traced by following the records of the inspection and tagging in the various stock yards in this country, and it has been clearly shown that no contagious disease existed where the animals were fattened, or where unloaded and fed in transit.

The effect of the regulations for the inspection and supervision of export cattle has been excellent from every point of view. The exportation of diseased cattle has been prevented; the losses at sea have been reduced to a minimum; the cattle have arrived in better condition than ever before; the insurance rates have been reduced, and the traffic has been facilitated. The British restrictions preventing the shipment of American cattle inland have not yet been revoked, but the reason alleged for their enforcement has been removed, and although the Government has been very deliberate and conservative in its action concerning this matter, it is presumable that in the end the United States will obtain fair treatment for this important branch of its export trade. Until this is accomplished, it is extremely important that the inspection service, both in this country and England, should be maintained. Without the record obtained from this service, the argument in favor of admission of our cattle could not be made conclusive.

MEAT INSPECTION.

The inspection of live stock and their products under the act of Congress approved March 3, 1891, has been continued in the manner prescribed in the regulations of March 25, 1891. The total number of animals examined which have been marked for identification in the manner prescribed in this law was, for the fiscal year ended June 30, 1893, 6,854,702. Of this number 3,922,174 were beef cattle, 92,947 were calves, 870,512 were sheep, and 1,960,069 were hogs. There were 1,036,809 quarters of dressed beef tagged and exported, and 10,534,102 quarters of dressed beef tagged for the interstate trade. There were 9,096,613 packages of canned, salted, and smoked beef stamped for identification, and 38,955 packages of pork products likewise stamped. Of the cattle inspected there were found diseased on ante-mortem examination 95, and on post-mortem examination 1,584 animals were condemned. Trichinæ were found in 60,108 carcasses of swine, being $3\frac{1}{20}$ per cent of those examined. Of the animals, excluding hogs, condemned

as unfit for human food, 133 were affected with actinomycosis, 583 with tuberculosis, 117 with Texas fever, 589 were badly bruised, and the remainder were otherwise affected.

IMPROVEMENT OF THE MICROSCOPIC WORK.

The experience of the Bureau in making microscopic examinations under the system first established proved that one microscopic examination of the three specimens taken from a carcass in the manner described in the regulations was not sufficient to conclusively establish the freedom of the carcass from trichinæ. The system was therefore changed on September 7, 1892, and an order was issued requiring a double examination to be made of each of the samples submitted for microscopic examination. Out of 1,172,047 carcasses examined since this order went into effect, there were found on the first examination 34,552 containing trichinæ, while on the second examination there were found 5,518 others affected in the same way. This demonstrates the necessity of a second examination in order to secure conclusive results.

COST OF INSPECTION.

The cost of the inspection of cattle, sheep, and calves for the year ending June 30, 1892, was 5½ cents per carcass. The cost of microscopic inspection of pork was 6 cents per carcass. For the year ended June 30, 1893, the cost of the inspection of cattle, sheep, and calves was reduced to 4⅓ cents per carcass, while the cost of microscopic inspection was increased by the double examination to 8¾ cents per carcass. The following tables show the cost of inspection in detail by months:

Statement showing the number of animals inspected, total cost of meat inspection and microscopical examination of pork, and average cost per head for examination during the fiscal year ended June 30, 1892.

Month.	Number of cattle, sheep, and calves inspected.	Cost of inspection.	Average cost per head.	Number of hogs inspected.	Cost of inspection.	Average cost per head.
			Cents.			*Cents.*
July	186,009	$12,337.54	6⅔	9,655	$2,025.51	21
August	280,600	14,402.55	5⅛	14,650	2,236.62	15¼
September	396,742	15,704.69	4	36,851	3,950.17	10¾
October	463,384	16,224.24	3½	108,978	5,961.16	5⅜
November	334,997	18,872.60	5⅝	119,387	6,047.31	5⅛
December	308,919	14,752.72	4¾	130,995	6,297.02	4⅞
January	325,449	19,541.96	6	118,290	6,451.60	5½
February	278,869	16,127.83	5⅜	126,447	7,006.23	5½
March	308,182	16,631.24	5⅓	113,297	7,205.37	5⅝
April	289,725	15,930.05	5½	141,865	7,026.61	5
May	315,906	20,887.66	6⅝	152,419	8,155.80	5¼
June	322,767	32,996.65	10⅕	185,241	14,701.82	7⅞
Aggregate	3,811,549	214,459.73	.....	1,276,075	77,065.22	.....

Average cost of inspection for the year: Cattle, sheep, and calves, 5½ cents per head; hogs, 6 cents per head.

Statement showing the number of animals inspected, total cost of meat inspection and microscopical examination of pork, and average cost per head for examination during the fiscal year ended June 30, 1893.

Month.	Number of cattle, sheep, and calves inspected.	Cost of inspection.	Average cost per head.	Number of hogs inspected.	Cost of inspection.	Average cost per head.
			Cents.			*Cents.*
July	367,655	$16,713.55	4 1/2	164,195	$9,671.83	5 7/8
August	412,756	17,043.61	4 1/10	181,666	11,494.09	6 1/3
September	472,156	16,348.01	3 3/8	126,017	11,686.02	9 1/4
October	489,672	17,289.29	3 1/2	127,923	12,330.49	9 5/8
November	461,043	21,341.62	4 5/8	137,446	12,848.76	9 1/3
December	398,390	20,644.23	5 1/8	159,341	17,175.70	10 3/4
January	400,448	20,379.19	5 1/2	213,307	19,823.92	9 1/4
February	358,117	19,021.27	5 1/3	181,654	17,996.44	9 9/10
March	387,723	21,982.70	5 5/8	177,187	17,341.78	9 3/4
April	376,842	19,858.04	5 1/4	171,701	14,568.14	8 1/2
May	386,251	17,652.71	4 1/2	182,734	14,229.04	7 7/8
June	374,580	18,006.15	4 7/8	145,898	13,200.87	9
Aggregate	4,885,633	226,280.37	.....	1,969,069	172,367.08	.....

Average cost of inspection for the year: Cattle, sheep, and calves, 4 3/4 cents per head; hogs, 8 3/4 cents per head.

EXPORTS OF INSPECTED PORK.

During the year ended June 30, 1892, there were exported of inspected pork 76,911 cases, containing 38,152,874 pounds. For the year ended June 30, 1893, the exports of inspected pork amounted to only 41,715 cases, containing 20,677,410 pounds. The quantity exported directly to countries requiring inspection in 1892 was 22,025,698 pounds, and in 1893, 8,059,758. There has consequently been a very heavy decrease in the amount of exports of inspected pork during the past fiscal year. It is asserted by packers and shippers that a considerable portion of the inspected pork which is shipped to Great Britain, Holland, and Belgium is reshipped to countries requiring inspection, but this Department has no means of determining the exact quantities. It should be added that the falling off in the export trade was not confined to inspected pork, but was also marked in the total quantity of pork exported to all countries. In 1892 the quantity exported was 665,490,616 pounds, while in 1893 it amounted to but 527,308,695 pounds. This decrease is, no doubt, accounted for by the high prices of pork which have prevailed in this country during the fiscal year 1893, and which affected the trade to countries requiring inspection more disastrously than the general trade, because the markets for American pork in those countries had been more recently opened and were less firmly established. The following table shows the number of pounds of inspected pork exported from the beginning of the inspection to June 30, 1893, by countries:

Statement showing the number of pounds of inspected pork products exported and examined under the act of Congress of March 3, 1891, from the first exportation of such products, September 6, 1891, to June 30, 1893.

Location.	Number of hogs examined.	Countries to which shipped.				
		Germany.	Belgium.	Holland.	Great Britain.	France.
Chicago	1,127,428	16,047,888	6,332,530	1,757,764	715,992	1,168,127
Milwaukee	360,793	2,274,124	578,232	466,043	6,176,820	139,198
Indianapolis	9,488	2,546	38,218	12,840	47,525	.....
Kansas City	659,018	1,138,151	941,397	479,313	167,877	223,533
South Omaha	305,245	1,450,394	936,305	682,806	55,557	18,504
Boston	313,821	5,861,833	2,221,324	2,805,037	.....	307,283
Ottumwa	60,656	137,731	.....	.....	565,589	6,820
Cleveland	91,100	189,661	12,365	.....	38,527	1,050
Buffalo	129,642	68,546	.....	.....	3,368,259	.....
East St. Louis	7,630	205,313	.....	.....	.....	.....
Pittsburg	17,905	.....	.....	.....	.....	.....
Aggregate	3,082,726	27,376,187	11,060,380	6,203,803	11,136,146	1,864,515

Location.	Countries to which shipped.						Total number of pounds.
	Denmark.	Italy.	Norway and Sweden.	Spain.	British Columbia.	Switzerland.	
Chicago	312,991	76,907	203,319	.....	.....	11,169	26,626,696
Milwaukee	15,085	.....	100,878	.....	.....	.....	9,750,380
Indianapolis	.....	.....	.....	.....	.....	.....	101,129
Kansas City	.....	.....	2,542	4,937	7,000	.....	2,964,750
South Omaha	.....	.....	25,642	.....	12,500	.....	3,181,708
Boston	428,325	6,609	.....	.....	.....	.....	11,630,411
Ottumwa	.....	.....	.....	.....	.....	.....	710,140
Cleveland	.....	.....	.....	.....	.....	.....	241,603
Buffalo	.....	.....	.....	.....	.....	.....	3,436,805
East St. Louis	.....	.....	.....	.....	.....	.....	205,313
Pittsburg	.....	.....	.....	.....	.....	.....	*268,274
Aggregate	756,401	83,516	332,381	4,937	19,500	11,169	59,117,209

*Stored in New York subject to export orders.

Statement showing exports of pork products to the countries requiring certificates of inspection, the estimated value of such products exported, and the expenses from the commencement of the work, June 22, 1891, to June 30, 1893.

Location.	Number of pounds exported.	Estimated value on basis of 12 cents per pound.	Cost of work to June 30, 1893.
Chicago	17,605,913	$2,112,709.56	$68,709.29
Milwaukee	2,428,407	291,408.84	23,533.67
Indianapolis	2,546	305.52	5,297.08
Kansas City	1,366,621	163,994.52	43,291.80
South Omaha	1,468,898	176,267.76	26,492.08
Boston	6,604,050	792,486.00	21,959.79
Ottumwa	144,551	17,346.12	8,923.11
Cleveland	190,711	22,885.32	13,174.89
Buffalo	68,546	8,225.52	12,268.25
East St. Louis	205,313	24,637.56	1,733.93
Total	30,585,556	3,610,266.72	225,383.89
Pittsburg	.....	.....	3,874.91
Nebraska City	.....	.....	6,563.68
Repairs	.....	.....	14.50
Aggregate	30,085,556	3,610,266.72	235,836.98

Statement showing number of pounds and cases of inspected pork exported during the fiscal year ended June 30, 1893.

Country.	Pounds.	Cases.
Germany	7,770,618	16,404
Belgium	4,107,923	7,807
Holland	1,822,067	3,501
France	271,325	522
Great Britain	6,621,351	13,248
Denmark	10,012	20
Italy	7,803	20
Norway and Sweden	25,642	50
British Columbia	19,500	125
Switzerland	11,169	18
Total	20,677,410	41,715

ADDITIONAL LEGISLATION NEEDED.

While the work of meat inspection has been found to be practicable and has been enforced without friction, the Bureau is not able, under existing laws, to properly dispose of unwholesome and condemned carcasses. An extension of the inspection, which has been made since the close of the fiscal year ended June 30, 1893, to the ante-mortem and post-mortem examination of swine, increases the number of condemned carcasses and adds to the difficulty of protecting consumers from condemned meat. The act of Congress of March 3, 1891, under which this inspection is carried on, does not definitely provide for the disposition of unwholesome or diseased carcasses. Section 5 of this act makes it unlawful for any person to transport from one State to another the carcasses of any sheep or swine, or the products thereof, which, on the inspection provided by the Department of Agriculture, had been declared by the inspector to be unsound or diseased. A penalty is provided for any violation of this section. There is nothing in the law, however, which prevents the marketing of these diseased carcasses in the State where the animals are killed. While there is no difficulty in condemning an animal that is found to be diseased or in placing a tag on the carcass, it is still possible for the owner to remove this tag and use the carcass in the local trade. It may be added that it is practically impossible for this Department to follow such diseased carcasses into the local market and prevent their being resold and shipped outside of the State. It is an unfortunate fact that there is not proper protection in the law for the consumers of meat in the State where diseased animals are killed, and that such meat may be shipped into other States without detection in the manner above indicated. To guard against this danger there should be some legislation compelling the immediate destruction of any animal or carcass found by the inspectors of this Department to be diseased and unfit for human food. In no other way can the public be properly protected against the use of this meat.

FUTURE WORK OF THE INSPECTION DIVISION.

The present duties of the inspection division indicate that the inspection of export cattle, import cattle, vessel inspection, the transportation of Southern cattle, and meat inspection may be considered as having become regular and permanent lines of work. These different branches of the service, with the exception of meat inspection, are now well organized and have a force sufficient to cover the entire field of work. The

meat inspection must still be extended to many different abattoirs where it has not yet been enforced. An order of September 13, 1893, extends the meat inspection to all swine slaughtered in the United States for both the interstate and export trade. This will require an increased number of inspectors and assistants. The time has come, however, when there is no longer reason for not enforcing the act of March 3, 1891, which requires the inspection of all cattle, sheep, and swine slaughtered for the interstate trade. The value and desirability of this inspection is appreciated by both the producer and consumer, and the importance of it is even greater than is generally supposed. The aim of the Department should therefore be, in the fulfillment of the duties devolving upon it under the statutes, to extend this inspection as rapidly as possible, until all the animals which are killed for interstate or foreign commerce come under this supervision.

PUBLICATIONS.

Three important bulletins have been issued during the year—one on Texas or Southern cattle fever, which changes almost entirely prevailing views in regard to this disease; the second giving a detailed report of the experiments for the cure of actinomycosis, which demonstrates that this disease, so long believed to be incurable, may be treated with great success; a third which gives the results of investigations in relation to infectious and parasitic diseases of domesticated animals. These bulletins are all extremely important. They contain investigations extending over a considerable period of time, and they are among the most valuable scientific publications which have recently been issued in any country.

REPORT OF THE CHIEF OF THE BUREAU.

TRANSACTIONS OF THE BUREAU FOR 1894.

MEAT INSPECTION.

The inspection of meat has, during the last fiscal year, constituted the most important and extensive part of the work of this Bureau. The ante-mortem and post-mortem examination has been extended to hogs at the various abattoirs where inspection has been established, thus greatly increasing the field of this service and more nearly fulfilling the object of the law.

The meat inspection is now in operation at 46 abattoirs, situated in 17 cities, and the greater part of the meat prepared for the interstate and export trade is inspected. There are, however, a number of large cities from which a great amount of meat is shipped to other States or o foreign countries, which, up to the present, have either inadequate inspection or none at all.

The extension of the inspection has necessarily been slow on account of the difficulty of obtaining competent inspectors, and the time required to organize the work and make it satisfactory at the different points. It has been found desirable to change many details in the methods of conducting the business and to require more specific reports from the inspectors, in order to prevent evasions of the regulations and to maintain a closer supervision of the work from the central office.

These changes have now been effected at each of the various places where the inspection is conducted, and the Bureau is prepared to extend the service as rapidly as the necessary inspectors and other assistance can be supplied.

The number of animals inspected has been increased from 4,885,633 in the preceding fiscal year to 12,944,056. This increased number handled, together with improvements in the methods, has reduced the expense of the inspection, exclusive of the microscopical examination of pork, from $4\frac{3}{4}$ cents per head in 1893 to $1\frac{3}{4}$ cents per head in 1894.

MICROSCOPIC INSPECTION OF PORK.

The quantity of microscopically examined pork exported during the year was 35,437,937 pounds, as compared with 20,677,410 pounds in 1893. The trade has therefore very largely increased; and this has been due partly to the fact that American firms have had more time to establish their business in the countries which formerly prohibited our pork, but for the most part to the lower prices which have prevailed in the United States during the last year. The greater part of the microscopic inspection is conducted with samples taken from the carcass at the time of slaughter. A considerable quantity of pork has been inspected in the piece, however, after the meat had been cut and cured.

The expense of examining the samples from one piece of pork is as great as that of examining samples from a whole carcass, and frequently greater, on account of the meat being hardened in curing and more difficult to prepare for microscopic examination. It is, therefore, more economical and in every way preferable to examine samples from the carcass before this is cut if other conditions are the same.

It has been found in practice that there are sometimes occasions when it is necessary to examine in the piece, in order to enable the packing house to make a shipment of the required amount of cured pork within a limited time. There are also packing houses which have had so few orders for inspected pork from countries requiring this inspection that it has been found more economical to inspect the cured pork in the piece when ordered than to inspect a great quantity of pork in the carcass, which might never be demanded for this trade.

During the year samples from 1,372,410 carcasses or pieces have been examined. The expense of this inspection has been diminished from $8\frac{3}{4}$ cents per carcass or per piece in 1893 to $6\frac{5}{9}$ cents in 1894—being a reduction of about 25 per cent in the cost for a given amount of work.

The reduction in the cost of inspection as compared with the quantity of microscopically examined pork actually exported has been even more gratifying. During the fiscal year 1893 there was exported 20,677,410 pounds of inspected pork, and the cost of the inspection amounted to $172,367.08 or 0.833 cent for each pound exported. For the fiscal year 1894 the quantity exported was increased to 35,437,937 pounds and the cost of inspection reduced to $88,932.10 or 0.248 cent for each pound exported.

A similar statement concerning the first and second halves of the last fiscal year shows that this reduction in the cost of microscopic inspection, compared with the quantity actually exported, was progressive throughout the year, and reached a lower limit than is indicated above. That is, from July 1, 1893, to December 31, 1893, the quantity of inspected pork exported was 12,618,706 pounds, and the expense of the microscopic inspection was $53,433.68, or 0.423 cent for each pound exported; while from January 1, 1894, to June 30, 1894, the quantity of inspected pork exported was 22,819,231 pounds, and the cost of inspection was $35,488.42, or 0.155 cent for each pound exported.

INSPECTION OF EXPORT ANIMALS.

In the inspection of animals for export 725,243 head of cattle were inspected, as compared with 611,542 for the preceding fiscal year. The number of cattle exported to Europe was 363,535 for 1894 and 294,002 for 1893, an increase of 69,533, or more than 25 per cent. There have also been exported during the year to Europe 85,809 head of sheep. All of these animals were inspected and their healthfulness certified to by the inspectors of this Bureau, and the cattle were all tagged with numbers for identification, and their origin recorded.

Of the cattle exported, 184 were rejected, as compared with 292 rejected during the year 1893.

VESSEL INSPECTION.

The vessels carrying the exported cattle and sheep were all inspected by the officers of this Bureau, in accordance with the act of Congress approved March 3, 1891, in order to secure sufficient ventilation, an adequate supply of food and drinking water, competent attendants, fittings sufficiently strong to avoid unnecessary danger of washing over-

board, and enough space for the animals to stand in with comfort. The regulations adopted in 1891 are still in force, but they have been amended from time to time and the condition of the cattle in transit has been continually improved.

This improvement is shown by the marked decrease in the proportion of cattle lost at sea. The loss for each year since the regulations went into effect was as follows: 1891, 1.6 per cent; 1892, 0.875 per cent; 1893, 0.47 per cent, and in 1894, 0.37 per cent.

The loss of sheep has been much heavier. Of the 80,898 exported and shipments inspected in Great Britain during the fiscal year, 1,050 were lost at sea. This is 1.29 per cent, and it indicates that more stringent regulations must be enforced to secure the humane treatment of these animals on shipboard.

STOCK YARDS INSPECTION.

An inspection at a number of the important stock yards of the country is maintained for the purpose of inspecting and tagging export cattle as near to their place of origin as possible. After being tagged and recorded, there is a supervision of the shipments in order to prevent infection of any kind on their way to the seaboard.

One of the greatest dangers during the summer months has been infected pens in the stock yards, or infected alleys, streets, or cars which have been contaminated by cattle from the Southern fever district. The cattle from this district, though apparently healthy, may so thoroughly infect the avenues through which they pass that these will be deadly for other cattle during the remainder of the season. This infection results as a consequence of adult ticks dropping from the cattle. These ticks lay about 2,000 eggs each, from which the young hatch in due time. It is these young ticks which get upon susceptible cattle and produce disease, as was shown in the special report of this Bureau on Texas or Southern cattle fever.

It has therefore been found necessary to set apart separate pens and alleys for these Southern cattle, and to disinfect the cars in which they have been shipped. To secure the enforcement of these regulations constant supervision and inspection must be maintained, for otherwise infected cattle would be allowed to enter the pens in which export cattle were handled, and this would do away with any possible chance of guarding against the infection. It is almost impossible, in the present state of our knowledge, to satisfactorily disinfect cattle pens which have once been thoroughly infected with this disease. Nothing but the freezing of winter can be relied upon to accomplish this. Infected pens are, consequently, a source of danger until after a succeeding winter has purified them.

The stock yards inspection is designed to guard against the Southern fever infection, but it also embraces the inspection and tagging of export animals, and the inspection of the vessels which carry them. These different lines of inspection are so closely allied that they can not be separated without detriment to the service and increased expenditures. It should be borne in mind, however, that the entire expense of the stock yards inspection is not for the benefit of the export trade, but that the cattle which are to remain in this country, more particularly the "feeders," are also protected.

The losses from the Southern or Texas fever have been almost entirely prevented by this inspection, and cattle may now be moved through our largest stock yards without danger, while before it was inaugurated a large part of the cattle so handled became infected.

This inspection, as it only continues during the spring, summer, and fall months, is reported for the calendar instead of the fiscal year. In the quarantine season, extending from February 15 to December 1, 1893, there were inspected and placed in the quarantine pens 1,737,380 head of cattle. In addition to this, the inspectors had 56,406 cars cleaned and disinfected under their supervision, and inspected 20,075 car loads of infected cattle which were en route for places beyond their jurisdiction.

INSPECTION IN GREAT BRITAIN OF ANIMALS FROM THE UNITED STATES.

This inspection has been continued during the year by two inspectors, one being stationed at London and the other at Liverpool. The object of this inspection is to learn the condition in which animals arrive, the extent of the losses at sea, the diseases with which animals in transit are affected or from which they die, the adequacy of the ventilation and fittings of the vessels for the safe transportation of their living freight.

This information can only be obtained from the representatives of this Bureau, who examine the animals both before and after they are unloaded from the ships. By means of this information improvements have been made by which the losses at sea have been reduced from 1.6 per cent the first year of the service to 0.37 per cent during the last fiscal year. This means a saving of 4,470 head of cattle on the exports of the last year. How much was saved by the regulations of the first year over the unregulated trade we have no data from which to determine, but it probably was a still larger number.

The British restrictions have not yet been removed from our cattle trade, but with the continued freedom of the United States from pleuro-pneumonia and other contagious diseases dangerous to the stock interests of that country, it is probable that reasonable modifications will be made.

The entire expense of the stock yards, vessel, and export animals inspection for the year was $96,617.44. At least half of this expense is for the prevention of Texas fever in this country, and should not be charged against the export inspection. This would give an expenditure of about $10\frac{3}{4}$ cents for each animal exported. Considering that this covers the tagging of every animal, and two inspections in the United States and one in Great Britain for the greater part of them, as well as inspection of the ships and supervision of the loading, it is seen that the service is very economically performed.

Following this estimate to its legitimate conclusion, we find that the $48,308.72 which we estimate was expended in inspecting and quarantining 1,737,380 head of cattle from the district infected with Southern or Texas fever, makes the cost of inspection 2.7 cents per animal, with no allowance for the disinfection of 56,406 cars.

INSPECTION AND QUARANTINE OF IMPORTED ANIMALS.

The number of animals imported from Europe inspected and quarantined on arrival was 11 head of cattle, 565 sheep, 43 hogs, and 4 goats quarantined at Garfield, N. J., and 1 head of cattle and 179 sheep quarantined at Patapsco, Md. In addition, 3 head of cattle imported from Canada were quarantined at Buffalo, N. Y. This makes a total of 806 imported animals that were quarantined during the year.

Under the provisions of the act of Congress approved August 30, 1890, requiring the inspection of all cattle, sheep, and hogs imported

into the United States from foreign countries, there were inspected as imported from Canada 194 head of cattle, 240,497 sheep, 1,302 hogs, and 2 goats.

SCIENTIFIC INVESTIGATIONS.

In the scientific work of the Bureau very important investigations have been made concerning the prevention of Southern cattle fever and in regard to the causation, nature, and prevention of tuberculosis and other diseases of animals.

Outbreaks of disease have been investigated in various parts of the country to determine if they were dangerous to the live stock of other States. Important investigations in the treatment of hog cholera have been made which have given very promising results.

Large quantities of tuberculin and mallein have been made in the laboratory of the Bureau and distributed to State authorities, State experiment stations, and educational institutions, as a means of determining the existence of tuberculosis in milch cows and of glanders in horses.

During the fiscal year ended June 30, 1894, there has been sent out tuberculin sufficient for 5,500 injections and mallein for 1,000 injections. The largest amount has been sent since January 1, 1894. It is now being used at the rate of 2,000 injections per month, with applications on file for as much as 1,000 injections per week from one State alone. Supplies have been sent on the application of the proper authorities to 33 different States.

PUBLICATIONS.

There have been published during the year the following reports and bulletins:

Eighth and Ninth Annual Reports of the Bureau of Animal Industry for the years 1891 and 1892. Published by order of Congress.

Bulletin No. 3. Miscellaneous Investigations Concerning Infectious and Parasitic Diseases of Domesticated Animals.

Bulletin No. 4. A Revision of the Adult Cestodes of Cattle, Sheep, and Allied Animals.

Bulletin No. 5. Report of the Dairy Industry of Denmark.

Bulletin No. 6. Additional Investigations Concerning Infectious Swine Diseases.

APPROPRIATION AND EXPENDITURE.

The appropriation for the year was $850,000 and the expenditures $495,429.24, leaving an unexpended balance of $354,570.76 to be turned into the Treasury.

REMARKS ON THE CONDITION OF THE SERVICE, AND RECOMMENDATIONS FOR THE CURRENT YEAR.

The meat inspection of the Bureau has not yet been developed and extended as contemplated in the law under which it was established. There are many large abattoirs which kill for interstate or foreign trade, and even some cities doing a large business of this character which have no inspection. It is really illegal for meat from such abattoirs to be shipped from one State to another, but if the operators of such establishments are unable to obtain inspection the Department would hardly be justified in stopping the marketing of their products.

The chief difficulty in rapidly extending the inspection is the failure to obtain a sufficient number of competent inspectors. The inspectors and assistant inspectors have been placed in the classified service; they are required to be graduates of a recognized veterinary college and to pass an examination held by the Civil Service Commission to test their competency. In the first examination only three passed out of over thirty candidates. That the examinations are not too difficult is shown by the fact that the lowest of the three eligibles is plainly demonstrated by his papers to be unfit for an inspector.

I believe that the reason so few competent men take the examination is that the salary of $1,200 for an assistant inspector and $1,400 for the majority of the inspectors is too low, considering the requirements and the nature of the work. Every inspector should have a good general education and thorough professional training. He should, in addition, be required to give up all private practice and devote his entire time to the work of the Bureau.

Meat inspection is very arduous work if properly performed. It requires long and irregular hours, constant attention, careful and thorough examination of the meat, and it must be performed in a damp place and in an atmosphere filled with steam, which is unpleasant in summer, and both unpleasant and unhealthy in winter. It apparently requires more inducement to secure competent men for this work than is now offered, and I would therefore recommend that the salary of assistant inspector be raised to $1,400, and that the lowest salary for inspector be fixed at $1,600.

With this change I believe that a sufficient number of competent inspectors might be obtained during the year to make it possible to establish inspection at all of the large abattoirs, and thus avoid charges of injustice and favoritism, and at the same time prevent the shipment of uninspected meat from one State into another. At present some of the inspectors at important places are young, inexperienced in business methods, and professionally incompetent, and should be replaced at the earliest possible moment with competent men.

REGULATIONS FOR SECURING THE DESTRUCTION OF CARCASSES UNFIT FOR FOOD.

The meat-inspection law as it now stands contemplates the destruction of condemned carcasses under the direction of the State or municipal authorities. This is a serious imperfection, and unless it is corrected the meat-inspection service can not accomplish the results expected of it.

In most places there are no local inspectors to cooperate for this purpose. There are in nearly every city more small slaughter houses where animals are killed exclusively for local consumption than can possibly be inspected by the local inspectors. As a consequence, the Federal inspectors are expected to see that meat unfit for food is not used for that purpose.

The only way to be certain that unwholesome meat is not used for food either locally or through the interstate trade is to see at once that every piece discovered is destroyed. If it is left for a local inspector to condemn, or if the packing house is allowed to dispose of it with the understanding that it is not to go into the interstate or foreign trade, there is no certainty that it will not be canned or shipped in some other form. Many of the people engaged in the meat-packing business have shown themselves to be unscrupulous; and, as it is impossible with any force at our command to watch every part of any great packing house

at all hours of the day and night, it is plain that nothing less than the prompt seizure and destruction of unwholesome meat will protect the consumer.

A bill has passed the House of Representatives and is now pending in the Senate which will, if it becomes a law, give the Secretary of Agriculture power to make the necessary regulations for the proper disposal of diseased carcasses. I recommend that its early passage should be urged. When we consider that 4,127 carcasses of beef were condemned during the past year as unfit for food, the importance of early action is manifest.

INSPECTION OF IMPORTED HORSES.

There is at present no veterinary inspection of horses imported into the United States. The law requiring the inspection of other species of animals was doubtless intended as a protection for the food supply of the country, and the matter of guarding against the contagious diseases of horses was not considered.

It is nevertheless certain that an inspection is needed in order to prevent the introduction of various kinds of contagion with imported horses. The disease known as maladie du coït was introduced and has been repressed at considerable expense to the Federal Government, and has also been the cause of much anxiety and expense in some of the States.

Glanders may also be introduced with imported horses, and no doubt has been so introduced in many instances.

I recommend that this needed inspection should be again brought to the attention of Congress, in order that, if deemed best, the Department should be given the necessary authority.

ADDITIONAL REGULATIONS NEEDED CONCERNING IMPORTATION OF CATTLE FROM MEXICO.

Renewed importations of cattle from Mexico make it imperative that the regulations concerning the importations of cattle should be so modified as to bring them into harmony with the act of August 30, 1890. This act provides for the inspection of all cattle imported into the United States, and prohibits the importation of any animals of this class which are infected or have been exposed to infection so as to be dangerous to the animals of this country.

There can be no question as to the prolongation of the Texas-fever districts into Mexico covering the sections adjacent to the Gulf and Pacific coasts. Just what the extent of these infected districts may be it is impossible in the absence of detailed investigation to determine. It is plain, however, that, as the Government of Mexico has not investigated the subject and outlined these districts, this Government can not decide what sections of that country are infected and what sections are free from infection.

In the United States the Texas-fever district is defined by the regulations of the Secretary of Agriculture concerning cattle transportation. Cattle from this district are allowed to be shipped to other sections of the country for immediate slaughter only during the season of the year when the disease may be communicated. The cattle raisers of this great district are entirely shut off from the northwestern market for grazing or range cattle.

During the last few weeks large numbers of Mexican cattle have been imported to be sold for grazing purposes in the Northwest. These

cattle come without having been subject to any regulations in the country of their origin to determine whether they are infected or free from infection, and they have been going into a market from which a large part of the Texas cattle are excluded.

Imported Mexican cattle are required to be held for inspection as provided in the law, but inspection of large herds of these wild cattle can not be thorough and should not be relied upon to prevent the introduction of disease. It is my opinion that, until the Mexican authorities define the Texas-fever district, and provide competent inspectors to certify that the cattle coming from that country are free from infection, all Mexican cattle should be treated as infected.

This certainly is the only safe plan to adopt, because owing to the low price of Mexican cattle the speculators will not confine themselves to purchasing from the elevated sections, which are presumably free from infection, but will extend their operations into the lower and more dangerous regions. It would therefore be but a short time until the range country and the grazing States would be overrun with these cheap cattle, carrying the Texas-fever infection with them and causing such outbreaks of disease as we have not had for many years.

If the cattle from the infected district in the United States are only allowed to go to market for immediate slaughter, equally rigid restrictions should be applied to infected cattle from Mexico, and as there is no way of determining which are infected and which are not, all cattle from that country should be regarded as infected. Regulations to this effect would, however, entirely prohibit the importation of Mexican cattle, because they are not fit for immediate slaughter and would not be imported for that purpose; and also because the statutes prohibit the importation of infected cattle.

It seems clear that under the law Mexican cattle should be declared infected from February 15 to December 1, which is the period that the Texas-fever regulations are applied to the cattle of the United States; and I would recommend that such regulations be at once adopted.

It has been stated by Arizona cattlemen that large numbers of their cattle stray across the border into Mexico and that likewise large numbers of Mexican cattle stray into Arizona. Some of these men represent that it would require 15 inspectors to inspect such stray cattle as are being returned at this season of the year.

The probability is that such an inspection is not necessary as a protection against disease, since the cattle would not stray far enough to reach the infected districts. I have therefore provisionally discontinued such inspection, as there were not enough inspectors available to promptly inspect all of the cattle that were to be returned.

It appears to me, however, that there is a great opportunity offered by this practice of returning large numbers of stray cattle for defrauding the revenues of the Government. An inspection would probably be a great protection against such frauds, and the matter is therefore submitted for consideration, but without recommendation, as the matter of revenues has no connection with the duties of this Bureau.

THE WORK IN REGARD TO TUBERCULOSIS.

The testing of cows with tuberculin in the District of Columbia is now in progress, but has been commenced in a small way in order to develop a satisfactory plan of operations. About 125 cows have been tested, and 20 per cent of these were found to be affected.

I would now recommend a larger force and more vigorous operations. With the present force and facilities, but a few thousand dollars can

be used during the year out of the $100,000 appropriated for this purpose. With twice as many men and better facilities for getting over the ground several times as much work can be accomplished.

As tuberculous cows are taken out of the dairies new animals must be put into their places, and it is desirable that these should be tested before they are allowed to enter the stables which have been disinfected and freed from disease. To do this at present the herd inspection must be interrupted, and as the number of inspected herds increases, the interruptions will be more frequent, until the herd inspection will be entirely stopped. It is important, therefore, that men should be stationed at the stock yards to test all cows that are brought into the District. This will prevent the further introduction of the disease, and will enable us to keep free from it the herds which have already been inspected.

This work in the District is of great importance, not only as a preventive of disease among the consumers of meat and milk, and to guard against the spread of tuberculosis from the District into adjoining States as required by law, but as an experiment to determine various questions relating to the prevalence, recognition, and prevention of tuberculosis as affecting dairy stock. The scientific results of this work are therefore of great value to the whole country, while the practical work is of benefit to only a small section. These scientific results are urgently needed in order that the various States may formulate proper measures for protecting their citizens, and for that reason, if no other, the work should be pressed to early completion.

Under any circumstances only a small part of the amount appropriated can be expended during this fiscal year, as one-third of the year has already elapsed. More rapid work also means more thorough work. There is less opportunity to shift diseased cows from the uninspected to the inspected dairies, and the first inspection should be completed before a second one is necessary.

Detailed recommendations as to requirements will be made from time to time as occasion demands.

EXTENSION OF THE BUREAU WORK.

The work of the Bureau of Animal Industry is now confined almost entirely to animal diseases. The meat inspection, the export-cattle inspection, the stock yard inspection, the import-cattle inspection, the tuberculosis work, the scientific investigations, all relate to diseases. The law, however, contemplates that there should be investigations in regard to the condition of the animal industries, with the distribution of information calculated to improve them and render them more profitable.

The dairy industry should receive immediate attention, and efforts should be made to improve its condition by collecting and distributing information on the subject, and in that manner educating our dairymen. The results obtained by Canada in this direction are very interesting and instructive. It is not many years since cheese from the United States was preferred in the London markets to Canadian cheese, and brought a higher price. The Canadian Government, however, began a systematic effort to educate the dairymen of that country. Printed information was distributed; practical men were sent to demonstrate improved methods, and the importance of making a higher grade of products was constantly taught.

The results of these systematic and persistent efforts have wrought such great improvement that Canadian cheese is now preferred in the London markets to that from the United States. The Canadians have enlarged their foreign market and secured better prices for their products.

No one can doubt the importance of improved dairy methods in the United States. They are needed to secure better prices at home, and to retain and recover the foreign markets. Our dairymen need persistent and authoritative instruction as to the advantage and profit to them of breeding better cows; of feeding the best combinations of food; of handling their milk, butter, and cheese according to the most improved and scientific methods.

The beef cattle industry, the sheep industry, the swine industry, the poultry industry are equally in need of assistance of the same nature. The law authorizes the collection and dissemination of information for the benefit of all of the animal industries, and it appears to me that the time has come when an effort should be made in this direction.

In considering this question in the past it has always been thought necessary to establish a dairy division, a poultry division, and in general a division for each branch of work. Having recently given some thought to this subject, I am of the opinion that a competent man could be selected who would be able to cover all of these additional subjects. I feel certain that for $2,500 per annum it would be possible to secure a man who could do creditable work in all of these fields. He should be not only versed in the subjects mentioned, but he should be accustomed to preparing and editing reports. Such a man, with one or two clerks, would be able to inaugurate this much needed line of work, and besides could assist in preparing the Bureau reports for publication.

I would recommend that an appointment of this character be made at an early day, as in my judgment the development of the Bureau has been one-sided and abnormal considering the breadth of the organic act. Operations are in progress in all directions for preventing disease, and for guarding against the consumption of diseased meats, but very little is being done in other ways to assist those great industries, the interests of which, so far as the Federal Government is concerned, are committed to this Bureau.

APPROPRIATIONS FOR THE FISCAL YEAR ENDING JUNE 30, 1896.

I would recommend that the sum of $800,000 be placed in the estimates for the salaries and expenses of this Bureau for the next fiscal year, and $12,000 for the maintenance of the quarantine stations for neat cattle. These sums are the same as were appropriated for the current fiscal year, and will, I think, be ample.

UNITED STATES CATTLE QUARANTINE.

The superintendents of the various cattle quarantine stations report the names of the importers and the number and breed of each lot of animals imported during the years 1891, 1892, 1893, and 1894, as follows:

FOR THE PORT OF BOSTON, LOCATED AT LITTLETON, MASS.

Date of arrival.	Importer.	Address.	Port of shipment.	No. of animals.	Breed.
	Year ending December 31, 1891.				
Jan. 2	Henry G. S. Codd	Westfield, Iowa	Bristol, England	7	Dorset Horn sheep.
Feb. 1	C. S. Bingham	Vernon, Mich	Liverpool, England	58	Shropshire sheep.
Apr. 20	Hon. E. Burnett	Southboro, Mass	London, England	15	Guernsey cattle.
Do	do	do	do	4	Jersey cattle.
Do	do	do	do	19	Hampshire Down sheep.
Do	do	do	do	11	Southdown sheep.
Do	do	do	do	2	Berkshire swine.
Do	do	do	do	7	Yorkshire White swine.
Do	do	do	do	2	Tamworth swine.
May 21	Asa Peck	Providence, R. I	Liverpool, England	20	Hampshire Down sheep.
Do	do	do	do	5	Leicester sheep.
June 1	Geo. E. Jones	Litchfield, Conn	London, England	109	Dorset Horn sheep.
July 16	Jno. S. Goodwin	Chicago, Ill	Liverpool, England	1	Aberdeen Angus cattle.
July 29	Jno. H. Warren	Hoosac Falls, N. Y	do	1	Southdown sheep.
Aug. 15	Arthur Mathews	Ontario, Canada	do	4	Goats.
Do	do	do	do	10	Do.
Aug. 27	Asa Peck	Providence, R. I	do	1	Leicester sheep.
Sept. 5	Geo. E. Jones	Litchfield, Conn	London, England	88	Dorset Horn sheep.
Oct. 17	T. O. Chapman	Milwaukee, Wis	Liverpool, England	3	Do.
Do	do	do	do	3	Shropshire sheep.
	Total			370	
	Year ending December 31, 1894.				
Nov. 15	J. Hobart Warren	Hoosac Falls, N. Y	Liverpool, England	6	Southdown sheep.
Dec. 5	M. B. I. Goddard	East Greenwich, R. I	do	6	Do.
	Total			12	

No animals received at this station for the years ending December 31, 1892, and 1893.

FOR THE PORT OF NEW YORK, LOCATED AT GARFIELD, N. J.

	Year ending December 31, 1891.				
Feb. 2	Jas. Wickwar	Lower Sydenham, England	London, England	2	Shorthorn cattle.
Apr. 28	Austin Corbin	New York, N. Y	Dundee, Scotland	13	Aberdeen Angus cattle.
May 18	Wills A. Seward	Budds Lake, N. J	Bristol, England	7	Berkshire swine.
May 26	S. R. Bradley	Nyack, N. Y	London, England	4	Guernsey cattle.
Do	do	do	do	7	Merino sheep.

FOR THE PORT OF NEW YORK, LOCATED AT GARFIELD, N. J.—Continued.

Date of arrival.	Importer.	Address.	Port of shipment.	No. of animals.	Breed.
	Year ending December 31, 1891—Cont'd.				
June 18	W. A. Shafor	Middletown, Ohio	Liverpool, England	188	Oxford Down sheep.
Do	do	do	do	12	Hampshire Down sheep.
July 15	Henry Hilton	New York, N. Y	do	1	Southdown sheep.
July 29	John L. Thompson & Sons	Marion, Ind	do	291	Shropshire sheep.
Do	do	do	do	10	Hampshire Down sheep.
Do	do	do	do	8	Oxford Down sheep.
Do	J. Keenan	Le Roy, Ill	do	103	Shropshire sheep.
Do	do	do	do	19	Oxford Down sheep.
Do	Blake Bros	Concord, Mich	do	199	Shropshire sheep.
Do	L. S. Dunham	Galesburg, Mich	do	45	Do.
Aug. 19	N. B. Proal	New York, N. Y	do	22	Southdown sheep.
Sept. 9	J. M. Work	Bardolph, Ill	do	59	Shropshire sheep.
Sept. 30	Thos. Wyckoff	Davisburg, Mich	Hamburg, Germany	23	Rambouillet sheep.
Oct. 2	C. B. Dustin	Summer Hill, Ill	Glasgow, Scotland	11	Shorthorn cattle.
Oct. 16	R. J. W. Bristow	Captain steamship Persian Monarch	London, England	8	Highland sheep.
Do	do	do	do	2	Shetland sheep.
Nov. 11	Daniel Taylor	Bay City, Mich	Liverpool, England	42	Shropshire sheep.
Do	W. C. Edwards	Ontario, Canada	do	20	Do.
Do	do	do	do	1	Berkshire boar.
Dec. 3	Robt. Hoe	New York, N. Y	London, England	1	Do.
Dec. 18	Geo. Lough	Cooperstown, N. Y	Liverpool, England	1	Cheviot sheep.
Dec. 30	Edw. Norton	Farmington, Conn	do	20	Guernsey cattle.
	Total			1,119	
	Year ending December 31, 1892.				
Apr. 19	Hon. Thos. Wyckoff	Davisburg, Mich	Havre, France	2	Rambouillet sheep.
May 25	S. C. Wilmans	San Francisco, Cal	do	30	Do.
June 10	Hon. T. Beale	Washington, D. C	Via London, England	17	Persian Fat-tailed sheep.
June 22	Aug. Belmont & Co	New York, N. Y	Havre, France	1	Normandy cow.
July 20	L. S. Roth	Buffalo, N. Y	Bremen, Germany	1	Buffalo cow.
Aug. 3	Francis Shaw	Wayland, Mass	Liverpool, England	11	Guernsey cattle.
Oct. 18	Dr. W. A. Conklin	New York, N. Y	do	1	Camel.
Nov. 17	Col. T. R. Roberts	Detroit, Mich	London, England	8	Red-polled cattle.
Dec. 14	Jas. S. Snell	Marshall, Mich	Liverpool, England	30	Shropshire sheep.
Do	do	do	do	20	Hampshire Down sheep.
Do	L. B. Harris	Lyndonville, Vt	do	14	Shropshire sheep.
Dec. 31	J. W. Martin	Richland City, Wis	do	12	Red-polled cattle.
	Total			147	

Year ending December 31, 1893.

Jan. 5	Thos. W. Wyckoff	Davisburg, Mich	Hamburg, Germany	2	Rambouillet sheep.
Jan. 10	Geo. Lough	Hartwick, N. Y	Liverpool, England	1	Cheviot sheep.
Feb. 7	T. S. Cooper	Coopersburg, Pa	London, England	163	Dorset Horn sheep.
Do	do	do	do	2	Berkshire swine.
Feb. 14	T. N. Vail	Loudon Center, Vt	Liverpool, England	32	Shropshire sheep.
Feb. 17	Chas. H. Hutchinson	White Pigeon, Mich	do	56	Do.
Mar. 22	R. A. Sibley	Rochester, N. Y	do	1	Jersey cow.
Do	Francis Shaw	Boston, Mass	do	7	Guernsey cattle.
Do	F. S. Peer	Mount Morris, N. Y	do	2	Devon cattle.
Mar. 26	W. G. Markham	Avon, N. Y	Hamburg, Germany	25	Rambouillet sheep.
Apr. 7	Dr. W. A. Conklin	New York, N. Y	Liverpool, England	2	Zebu bulls.
Do	do	do	do	4	Egyptian sheep.
Do	do	do	do	2	Italian goats.
Do	do	do	do	1	German goat.
Do	do	do	do	1	German sow.
Do	do	do	do	1	English boar.
Do	do	do	do	3	Russian swine.
Apr. 19	Dr. G. H. Davidson	Millbrook, N. Y	do	68	Shropshire sheep.
Do	do	do	do	1	Berkshire swine.
Apr. 26	H. H. Clough	Elyria, Ohio	do	4	Hereford cattle.
May 6	C. H. Otten	Bellasylva, Pa	Bremen, Germany	5	Sheep.
May 24	Jno. S. Goodwin	Chicago, Ill	Liverpool, England	3	Aberdeen Angus cattle.
June 21	Oakleigh Thorne	Millbrook, N. Y	do	127	Shropshire sheep.
Do	T. S. Cooper	Coopersburg, Pa	do	183	Dorset Horn sheep.
Do	Jas. F. Sutton	New York, N. Y	Bordeaux, France	23	Normandy cattle.
June 28	Fred P. Earl	Kalispel, Mont	Liverpool, England	9	Hampshire Down sheep.
July 6	J. A. Morris	Westchester, N. Y	do	2	Southdown sheep.
July 12	W. A. Shafor	Middletown, Ohio	do	190	Oxord Down sheep.
Do	do	do	do	38	Hampshire Down sheep.
Do	do	do	do	27	Shropshire sheep.
Do	do	do	do	19	Dorset Horr sheep.
Do	do	do	do	4	Southdown sheep.
Do	do	do	do	2	Cheviot sheep.
Do	do	do	do	4	Toggenburg goats.
July 19	Jno. L. Hays & Son	Mannington, W. Va	do	100	Shropshire sheep.
July 26	W. A. Shafor	Middletown, Ohio	do	1	Hampshire Down sheep.
Sept. 14	Metcalf Bros	East Elma, N. Y	do	1	Berkshire boar.
Sept. 20	W. Bayard Cutting	New York, N. Y	do	26	Shropshire sheep.
Oct. 26	Wills A. Seward	Budds Lake, N. J	London, England	2	Berkshire boars.
Nov. 7	A. J. Cassatt	Paoli, Pa	do	2	Guernsey cattle.
Nov. 25	Thos. Ainslee	Cooperstown, N. Y	Glasgow, Scotland	1	Cheviot sheep.
Dec. 7	John L. Hays & Son	Mannington, W. Va	Liverpool, England	132	Shropshire sheep.
Do	Chester W. Chapin	New York, N. Y	Antwerp, Belgium	7	Norman cattle.
Dec. 29	A. A. Thomson	Water street, N. Y	Swansea, Wales	2	Tamworth swine.
	Total			1,288	

FOR THE PORT OF NEW YORK, LOCATED AT GARFIELD, N. J.—Continued.

Date of arrival.	Importer.	Address.	Port of shipment.	No. of animals.	Breed.
	Year ending December 31, 1894.				
Apr. 19	Hon. Cassius M. Clay	Richmond, Ky	Liverpool, England	1	Southdown sheep.
Do.	Metcalf Bros	East Elma, N. Y	do	38	Berkshire swine.
Apr. 25	V. T. Hills	Delaware, Ohio	do	2	Red-polled cattle.
May 23	W. G. Markham	Avon, N. Y	Hamburg, Germany	22	Rambouillet sheep.
May 29	J. A. Morris	Westchester, N. Y	Liverpool, England	2	Southdown sheep.
July 5	Paul T. Norton	Summerville, N. J	London, England	3	Berkshire swine.
July 26	Dr. Geo. H. Davidson	Millbrook, N. Y	Liverpool, England	22	Shropshire sheep.
Do.	do	do	do	1	Hampshire Down sheep.
July 31	August Belmont	Newport, R. I	Bombay, India	9	India cattle.
Do.	do	do	do	3	Moose deer.
Aug. 7	Metcalf Bros	Elma, N. Y	Liverpool, England	10	Berkshire swine.
Do.	Ewing O. Craft	Heisterburg, Pa	do	9	Dorset Horn sheep.
Do.	do	do	do	10	Hampshire Down sheep.
Do.	Wm. Rockefeller	Tarrytown, N. Y	do	10	Southdown sheep.
Do.	do	do	do	2	Shropshire sheep.
Aug. 22	Levi P. Morton	New York, N. Y	do	24	Guernsey cattle.
Do.	J. Milton	Marshall, Mich	do	4	Hampshire Down sheep.
Oct. 1	H. K. McTwombly	Madison, N. J	do	17	Guernsey cattle.
Do.	do	do	do	17	Southdown sheep.
Do.	do	do	do	1	Jersey bull.
Oct. 3	C. B. Dustin	Summer Hill, Ill	do	3	Shorthorn cattle.
Oct. 11	Foote Bros	Medina, Ohio	do	1	Berkshire boar.
Oct. 31	T. S. Cooper	Coopersburg, Pa	do	55	Dorset Horn sheep.
Dec. 6	C. S. Hacker	Bakersfield, Cal	London, England	1	Jersey bull.
Dec. 19	Chas. Greer	Rye, N. Y	Hull, England	6	Southdown sheep.
	Total			273	

FOR THE PORT OF BALTIMORE, LOCATED AT ST. DENIS, MD.

	Year ending December 31, 1891.				
Apr. 30	Jas. L. Grant	Ingersoll, Canada	Liverpool, England	48	Tamworth swine.
Do.	do	do	do	4	Yorkshire swine.
May 20	Alex. Brown & Co	Baltimore, Md	do	1	Shropshire sheep.
June 25	J. H. Paul	Lake Huron, Minn	do	200	Do.
Do.	Henderson & Buchanan	Washington, Pa	do	13	Cotswold sheep.
Do.	do	do	do	1	Shropshire sheep.
Do.	do	do	do	67	Dorset Horn sheep.
Sept. 26	J. B. Niellson	Sinking Creek, Va	do	27	Shropshire sheep.
Do.	Howard Swineford	Richmond, Va	do	25	Do.
	Total			386	

	Year ending December 31, 1892.				
Mar. 4	Hon. Jno. Stewart	Elburn, Ill	Liverpool, England	3	Ayrshire cattle.
Sept. 2	C. J. Baker	Baltimore, Md	Hamburg, Germany	2	Holstein cattle.
Sept. 7	Baltimore Park Commission	do	London, England	2	Southdown sheep.
Nov. 26	Sam'l C. Kent	West Grove, Pa	Liverpool, England	129	Dorset Horn sheep.
	Total			136	
	Year ending December 31, 1893.				
May 6	Metcalf Bros	East Elma, N. Y	Liverpool, England	16	Berkshire swine.
May 27	Henderson & Co	Washington, Pa	do	319	Dorset Horn sheep.
July 7	Dr. J. C. Morris	Philadelphia, Pa	Swansea, Wales	1	Devon bull.
July 9	Henderson & Co	Washington, Pa	Liverpool, England	154	Dorset Horn sheep.
Oct. 1	T. J. Other	Ripon, England	do	25	Wensleydale sheep.
	Total			515	

FOR THE PORT OF BUFFALO, N. Y.

	Year ending December 31, 1893.				
Apr. 8	J. J. Bushong	East Palestine, Ohio	Markham, Canada	2	Jersey cattle.
Do.	O. R. Jones	Wales, Me	do	2	Do.
	Total			4	
	Year ending December 31, 1894.				
Apr. 21	O. B. Fisher	Assumption, Ill	Thorndale, Canada	1	Shorthorn cow.
Apr. 10	N. Burnham	De Kalb, N. Y	Brockville, Canada	2	Jersey cattle.
July 5	Jas. D. E. Hay	Derby, N. Y	Thorndale, Canada	24	Holstein cattle.
Nov. 23	D. P. Norton	Council Grove, Kans	Bridgen, Canada	1	Shorthorn bull.
Nov. 25	B. C. Rumsey	Buffalo, N. Y	Cayuga, Canada	1	Do.
Nov. 25	A. P. Grout	Winchester, Ill	Montreal, Canada	15	Aberdeen Angus cattle.
	Total			44	

FOR THE PORT OF NEW ORLEANS, LA.

	Year ending December 31, 1892.				
Mar. 23	Pierre Lanaux	Bay St. Louis, Miss	Liverpool, England	1	Shropshire sheep.

PREVALENCE OF ANTHRAX AMONG DOMESTICATED ANIMALS.

OUTBREAKS IN THE UNITED STATES.

In the latter part of July, 1893, the attention of the live stock commissioners of Illinois was called to the prevalence of a disease which was rapidly carrying off the live stock of Edwards, Wayne, and Clay counties, in the southern part of that State. Dr. Trumbower, the State veterinarian, was directed to make an investigation for the purpose of determining the nature of the disease. He readily recognized it as anthrax, and suggested vigorous measures for its suppression. It was reported that up to August 10 following at least 500 head of cattle alone had been lost by it in the above-named counties. The disease was so widespread and fatal that this Department directed Dr. V. A. Norgaard, an inspector of the Bureau of Animal Industry, to visit the locality and make an investigation as to the cause of the outbreak and report the results of the same to this Department. The following is a copy of Dr. Norgaard's report, which was submitted in August, 1893:

HISTORY OF THE OUTBREAK IN ILLINOIS.

In Wayne County, Ill., the Little Wabash River winds through low, marshy, wooded lands, and the river bottom affords in hot, dry summers, when the water becomes very low, a splendid opportunity for the development of micro-organisms. Many acres of land which under ordinary conditions are under water become exposed, and all organic substances left behind by the sinking water decompose and thus furnish, exposed to the sun, a veritable hotbed for all the lowest classes of organisms which happen to be present. Every summer of late years a limited number of cattle have died in this neighborhood from a disease unknown to the layman, but which from the description given of the symptoms must have been anthrax. The farmers, not being aware of danger, left the dead animals lying around unburied to be eaten by buzzards and dogs. One case noted is very characteristic. One day a farmer found one of his largest working steers dead, though the animal had been apparently healthy a few hours previous. Being very busy he left the carcass lying there in the pasture for several days, and then hauled it over to a small meadow and buried it. The same day several other head of cattle were taken sick, showing swelling on the body or suddenly dropping dead. In this way he lost a number of cattle, fifteen or twenty, and perceiving the danger he burned the carcasses. The following winter he kept a number of sheep in the inclosure where he had buried the first steer. The rain caused the earth, which had been thrown loosely on the carcass, to sink, and a pool was formed from which the sheep drank. Consequently they all died.

The following year a large number of cattle died in the neighborhood, and some of the carcasses were thrown into the river. In that way the disease spread rapidly, until it acquired such dimensions as to cause the State authorities to take the matter in hand. The unusually long drought this summer has caused the river to fall back very low, so low, in fact, that in many places there are only stagnant pools left, and the result is that in Wayne and adjoining counties between 1,500 and 2,000 head of horses, cattle, sheep, and swine have perished from anthrax. Not until late in the season did the State authorities succeed in persuading a number of the farmers to destroy the carcasses of the dead animals by burning them; but many of them refused to do so, especially those who had lost all their live stock and therefore

concluded that there was nothing to be gained by cremating the carcasses. The State board of health, therefore, appointed a number of supervisors whose duty it was to keep track of all diseased and dead animals, and see that the latter were burned. It was also resolved to impose a fine of $100 on anyone who did not dispose of the carcasses in the prescribed manner.

As so many carcasses were left lying around, especially in the early part of the outbreak, there can be no doubt that, if next year proves to be favorable for the development of the spores, the disease will gain far greater dimensions than it has this year, and the country around the Little Wabash River will become an anthrax district where the disease will remain.

SYMPTOMS OF ANTHRAX IN THE HORSE.

The anthrax bacillus may be introduced into the body in three different ways: Either through the mouth and alimentary canal, through the respiratory organs, or through the outer surface of the body. The last case was most frequently seen in my investigation of the disease, but from the information I gathered the two other ways must have been as common, or even more so, during the first part of the outbreak, as horses and cattle both dropped dead almost instantly, without showing any symptoms of disease until a few minutes previous to their collapse.

When the infection takes place through the skin, it is in most cases, I believe, introduced by the sting of insects, especially the large horsefly (*Œstrus equi*[1]). This fly carries the bacillus from the carcasses of the animals which have died of anthrax, and simply inoculates it in the skin of live animals. From here the bacillus spreads rapidly to the subcutaneous tissues, where it multiplies rapidly and causes a hard, warm, painful swelling, with well-defined margins, which spreads rapidly over the surface. The superficial lymph vessels in the vicinity become hard and swollen. The infection is usually accompanied by fever, loss of appetite, and accelerated respiration. After a few days the swelling becomes cold and painless and may either be absorbed or the disease spread to the inner organs and prove fatal to the animal.

The most common point from which the infection started was the point of the breast, the lower part of the abdomen, and the flank. In the first case, at the point of the breast, the swelling would extend down between the forelegs, involve the upper part of these, and extend as far back as the sheath. Upward it would advance but slowly, perhaps not more than 4 or 5 inches from the point of inoculation. In most cases, when the disease took a favorable turn, this swelling would commence to decrease in from five to seven days, and in about two weeks the horse would recover. If the disease spread to the internal organs the symptoms would be the same as if the infection had originally taken place through the lungs. When there is no inclination to absorption, gangrene will set in by forming small, hard nodules the size of beans, which then are circumscribed and expelled. In no cases did I notice any extensive gangrene as observed in purpura. (Many of these horses with extended swelling had a most horrible look owing to the treatment recommended by the local veterinary surgeon—repeated applications of concentrated carbolic acid and turpentine, equal parts, which either caused gangrene of the skin or at least made the epidermis come off in large places.)

When the infection takes place through the alimentary canal or through the lungs, the first symptoms are a very high fever, a small but very rapid pulse, the visible mucous membranes cyanotic, in some cases symptoms of congestion of the brain, but in almost all cases symptoms of colic, with diarrhea often mixed with blood. The respiration is from 70 to 80 a minute. The region about the larnyx and pharynx is the seat of a considerable swelling, which may extend down toward the point of the breast. The mucous membrane in the larynx and pharynx becomes swollen, often to such an extent that the respiration becomes roaring, and may be followed by dyspnœa and suffocation. The mucous membrane is the seat of an extensive œdematous hemorrhagic infiltration.

The disease lasts usually from a few hours to two or three days. Recovery is very rare.

Post-mortem examination.—It proved very difficult to obtain material for post-mortem examinations, as all animals were burned immediately after death. I shall here describe the post-mortem held upon a horse which had been sick for two weeks. It was first externally affected with a large swelling in the left flank and inguinal region, which, however, had almost completely disappeared when the horse began to show symptoms of a general infection, with swelling around the larynx extending down along the trachea, roaring, accelerated respiration, and high fever. Death resulted four days later. The carcass was very bloated; blood-colored excretion from the nose; in left flank and inguinal region a slight diffuse swelling, which could

[1] Probably he refers to *Tabanus*.—C. W. S.

hardly have been perceived if not pointed out by the owner as the place where the disease started. The veins under the skin were expanded by dark, almost black, thick blood. In left inguinal region there was under the skin a diffuse sero-fibrinous infiltration in which was seen numerous patches and smaller hemorrhages. The abdominal cavity contained about 2 gallons of dark-red serous exudation. The peritoneum and that part of the mesentery which suspends the colon, and especially the cæcum, was the seat of immense blood extravasation. The mesenteric glands were œdematous and swollen to the size of a goose egg or more, and full of blood extravasations. The same was the case with most all of the lymphatic glands, particularly those along the trachea and in the mediastinum. The spleen was about double its normal size, of a dough-like consistency, and the pulp very dark. The liver was considerably enlarged, blood-filled, and the seat of a parenchymatous inflammation. The portal lymph glands swollen and infiltrated with blood. The kidneys were very dark and hyperæmic, considerably swollen, and of a soft consistency (parenchymatous inflammation). The mucous membrane in the small intestine was swollen and studded with small petechiæ, which increased in number and size toward the colon. The colon and the cæcum were the seat of a severe inflammation, with a diffuse, bloody extravasation, both in the subserous and in the submucous tissue, which made the wall of these intestines from one-half to three-fourths of an inch thick. Similar lesions were seen in the rectum. The contents of the intestines were of a thin, darkened fluid nature.

Around the pharynx and the larynx was a sero-fibrinous exudation, stained dark red by blood extravasations. This extended down along the trachea into the thoracic cavity, in the anterior part of which it formed an immense gelatinous mass resembling a blood clot, only more transparent, and completely surrounding the heart. The pericardium was thick and inflamed; it contained about a quart of a dark-red exudation. The lungs were dark red and hyperæmic, and the trachea and the bronchi contained a bloody froth. The mucous membrane in the larynx, especially on the epiglottis, was œdematously swollen and of a dark-red color.

In peracute or acute cases many of these symptoms may fail, as the animal dies from a congestion of the brain or from suffocation before they have time to develop.

ANTHRAX IN CATTLE.

In cattle the symptoms are pretty nearly the same, as far as could be ascertained by questioning the farmers. I did not have an opportunity of examining any fresh acute cases. There were, however, a number of cases of inoculation by means of insects, but these were not of a very serious nature, as the animals usually recovered in a week or two. This, however, must be credited to the attenuation of the virus, which is known always to take place at the end of the outbreak, and also to the fact that flies and other insects were much less numerous than in the earlier part of the season. Most of the swellings appeared on the flanks or the lower part of the body, but none had been noticed on the back or on the hind quarters. These swellings had all well-defined margins, and were of a solid, œdematous nature. On none of those which I examined did I see any symptoms of gangrene.

ANTHRAX IN SHEEP.

The disease had also been very common among sheep in the beginning of the outbreak, and a large number of these animals had succumbed. It had been very acute and fatal among this class, killing them almost instantly. I noticed a few cases, however, which had very large swellings around the lower jaw and the neck. The owner told me that they had been very sick for several days and unable to take any food, but that they were now apparently recovered. The mucous membrane in the mouth, especially the posterior part of the tongue, was dark and swollen. Many farmers who had lost horses and cattle from anthrax informed me that their sheep had been affected in the same way, viz, with the swelling around the neck, but that most of them had recovered.

ANTHRAX IN SWINE.

I had no opportunity of seeing it, although I was told that a number of hogs and pigs had died of anthrax. As I was very anxious to see the disease in swine I applied to the local veterinary surgeon to notify me as soon as he heard of any such cases. He soon afterwards told me that he had some pigs a few miles outside of town which were dying rapidly of anthrax. I went out at once and killed one of them, but the post-mortem showed only the lesions of hog cholera, and I am inclined to believe that most of the hogs which have died here this summer have perished from hog cholera, of which I saw a number of cases throughout the country. On several places, however, I saw hogs with swellings under the throat and on the abdomen, but I had no opportunity of investigating the cases further.

In most cases it was extremely difficult to convince the farmers that the investigations made were for their own benefit. I shall only mention one instance where I had heard of a horse being sick. The locality was about 9 miles from Fairfield. I hastened to the place and found the horse dead. The owner and a number of neighbors had piled three or four cords of timber on top of the carcass and set fire to it. I explained to these gentlemen the danger of the disease coming back next year, and how important it was to get fresh material by means of which the disease might be investigated and a remedy found for it. They finally consented to my making a post-mortem if I would myself put out the fire, take all the logs away, and afterwards put them all back again. But there will probably be ample opportunity of gathering fresh material next year, if the weather proves at all favorable to the disease.

Very respectfully, VICTOR A. NORGAARD.

The report of the board of live stock commissioners for the State of Illinois for the year ended October 31, 1893, refers to the outbreak of anthrax as follows:

On the 1st of August, 1893, a letter reached our office at Springfield, dated July 31, from Louisville, Clay County, written by Mr. J. F. Glardon, stating that "many cattle are dying here. Well in the morning and dead in the evening."

Another letter from the county clerk, Mr. William Brissenden, of Clay County, dated August 3, stated that "cattle are dying after a few hours' sickness, near Louisville."

Another letter from Ellery, Edwards County, written by John T. Woods, dated August 3; also a telegram from William Hopkins, of Albion, stated that "horses, cattle, and hogs are dying in great numbers in Edwards and Wayne counties."

All demanded an immediate investigation.

The secretary was instructed to telegraph Dr. M. R. Trumbower, the State veterinarian, to go at once to Albion, Edwards County, and investigate this disease among the animals. The dispatch was sent on the 3d, and Dr. Trumbower reached Albion on the 4th.

He went to Scotts Station, examined a number of sick animals, and interviewed people who had lost stock, readily obtaining sufficient evidence that this malady was truly the malignant type of anthrax.

Great excitement prevailed in the community, and it was necessary that some steps should be taken at once to inform the people how best to protect themselves against this scourge, and to check its ravages if possible.

Dr. Trumbower had the following circular published and caused it to be widely distributed:

TO ALL WHOM IT MAY CONCERN.

I have this day investigated the disease which has been afflicting the horses, mules, cattle, and hogs in the vicinity of Scotts Station, Wayne County, Ill.

It is a disease known as "malignant anthrax" or "charbon;" "malignant pustule" in man. Recoveries of affected animals are very rare, and it is not advisable to attempt medical treatment, for past experience throughout all ages and countries has shown that treatment has been of no avail.

The following rules for protection are absolutely necessary to control the malady:

(1) All animals that die with this disease should be immediately burned, not buried, for the reason that burial of such carcasses preserves the germ of the disease, as it has its primary residence in the soil.

(2) No dead animals should be skinned, or in any way handled by persons with sore, wounded, or scratched hands.

(3) Dogs and hogs should not be allowed near a dead animal, as they readily contract the disease by eating the blood or flesh.

(4) All animals—horses, mules, cattle, and hogs—should be removed from the infected region to upland pastures, clear of timber or stagnant pools of water. If this is not available, they should be closely housed in darkened stables to exclude the flies. Work horses and mules, when out of the stable, should be covered by a sheet from head to tail to protect them from the flies. Flies frequently are the carriers of the contagion from diseased or dead animals to healthy ones.

By a strict observation of these rules the disease may be controlled to a very great extent, possibly completely eradicated.

A public meeting is called to convene at 3 o'clock p. m. at Scotts Station, on Tuesday, August 8. All persons interested are requested to be present and meet the State board of live stock commissioners.

M. R. TRUMBOWER, *State Veterinarian.*

The meeting called by Dr. Trumbower for Scotts Station on the 8th was attended by several hundred stockmen and farmers from Wayne and Edwards counties. The full board of live stock commissioners, with their secretary, and Dr. Trumbower, the State veterinarian, were present. Mr. C. D. Bartlett, the president of the board, introduced Dr. Trumbower who addressed them, explaining the character of the disease, the measures necessary to adopt for checking its ravages, the reasons why this malady could not be stamped out at once; and he was called on to answer many questions. In the presence of this concourse of interested people, the live stock commission, and several medical men who were there, Dr. Trumbower then made a post-mortem examination of a colt, which the owner, Mr. Elmer Woods, allowed to be killed for the purpose. The diseased condition of this animal, as demonstrated by the doctor, proved to all conclusively that they were indeed smitten by a disease that had heretofore been strange to them.

Citizens from Fairfield, Wayne County, were present to invite the board to visit their town and instruct them what to do, as the disease had appeared at that place.

Dr. J. W. Scott, the secretary of the State board of health, had been requested to attend this meeting for the purpose that will be stated hereafter. Before leaving Scotts Station the following telegram was received from him:

SPRINGFIELD, ILL., *August 8, 1893.*

Your letter received too late to comply with your request. I recognize the gravity of the situation and we will cooperate with you to the fullest extent of the power of the board. See the local board and call their attention to provision of section 2, article 4, for the protection of public health, which defines their power. Will come later if you think necessary.

J. W. SCOTT, M. D.,
Secretary Board of Health.

Dr. M. R. TRUMBOWER,
Veterinary Surgeon.

In the evening the board met the city board of health of Albion, Edwards County, and they at once proceeded to institute measures to protect their meat and milk supply and recommend and enforce the proper disposal of all dead animals within their district.

On the 9th we all proceeded to Fairfield, met and consulted with a number of their medical men and prominent citizens. Dr. Trumbower was requested to make a post-mortem examination of a cow which died that morning in the edge of town. He acceded, and was able to demonstrate the specific character of the lesions induced by the disease in this animal.

From Fairfield the board went to Louisville, and met, in the office of the county clerk, many of the farmers and stockmen of that locality. Explanations and instructions were offered by Dr. Trumbower, and a general desire was manifested by all to take steps to at once combat the disease which was prevailing to an alarming extent in four townships of Clay County. The ravages of the disease and the alarm of the people were met alike at all places visited by the board.

For many reasons this board was almost powerless to afford aid; the want of money, men, the power of the law, all contributed toward making practical work impossible. Such measures as were set forth in the circular issued by Dr. Trumbower became imperative, but how to

enforce them at once became the question. Organization of some kind was demanded. Concerted action, with power to enforce necessary regulations, and proper persons to take charge constituted the needs of the hour. Quarantining the animals in the infected area could do only harm instead of good, as the disease is not communicated by contact of animal with animal. Disinfection was impossible; driving all the animals out of the infected district into uninfected sections was impracticable. So that all that was left for the board to do was to give advice how to proceed and rely upon the citizens of the infected districts to adopt it and act upon it. Looking upon this disease as a menace to public health, the board believed that the State board of health could materially aid it by lending its assistance in the organization of the local boards of health, ask, and, if necessary, compel them to carry out such measures as the combined boards might see fit to promulgate.

Eight persons became inoculated with this disease through skinning dead animals, two of whom were affected so severely that their lives were in the greatest danger, though they ultimately recovered.

Another series of meetings was called at which Dr. J. W. Scott, the secretary of the State board of health, was present. For these meetings invitations were sent by the county clerks to the supervisors, assessors, and town clerks of each township to be present, as these three officials of a township constitute a local board of health.

Dr. Scott, the commissioners, and Dr. Trumbower met these officials at Albion on the 15th, Fairfield and Louisville on the 16th, and McLeansboro, Hamilton County, on the 18th of August.

As a result of these meetings rules were adopted by the boards of supervisors of Wayne, Clay, and Hamilton counties and by the county commissioners of Edwards County, for the prevention of the disease, making it the duty of the local boards of health and the county health officer to enforce the said rules.

In their report for the year ended October 31, 1894, the live-stock commissioners state that occasional cases of anthrax occurred during the winter and spring. "It appeared in three counties, and destroyed over sixty head of horses and cattle."

Fearing a virulent outbreak during the hot, dry weather in August, 1894, the board issued a bulletin describing the symptoms of the disease and giving rules for preventing its spread, which was distributed through the counties formerly infected.

THE DISEASE IN DELAWARE.

In August, 1892, the attention of the officers of the Delaware College and Experimental Station was called to the prevalence of a mysterious disease which had caused the death, at short intervals, of a number of cows. Dr. Eves, a competent veterinarian, was directed to make an examination and determine, if possible, the nature of the disease and the cause of the outbreak. No previous losses had occurred on the farm where the disease first made its appearance, and no clew was given as to the cause of the outbreak. After a number of post-mortem examinations he pronounced the disease anthrax. The afflicted herd was pastured on a low-lying meadow, where several fatal cases had occurred in quick succession. The remaining cows were soon removed to high ground, where one or two animals died soon after. For several weeks after this no new cases were reported. Late in the fall the herd was again turned into the meadow pasture, where 2 additional cases soon developed. During the months of August, September, and October 10

cows and 1 horse were killed by the contagion on that farm. On another farm, about 1 mile distant, a cow died suddenly in the second week in August. The milk flow had practically ceased, and the hind quarters of the animal seemed partially paralyzed. It dropped dead and the carcass was thrown into a dry gully which had been washed out by heavy rains. Seven other cases occurred in that herd in about one week, and during the month of August 10 animals out of a herd of 30 were lost. These were the only cases that occurred in this herd. The location of the farm was on the highest land in that section of the State, and no connection, Dr. Eves states, between this herd and the one on the lowlands could have occurred.

During the second week in August several deaths occurred from the disease on a third farm. Being in close proximity to the second farm, which was located on high land, it was thought that drainage from this farm carried the contagion and caused the outbreak. On this farm cows giving a full flow of milk at sundown were found dead in the field at sunrise in the morning. There were 18 cows in this herd, out of which 8 deaths occurred. During the summer and fall the animals on ten farms were affected, and on these farms 40 cows and 9 horses were known to have died. The crisis seemed to have been reached in August, but isolated cases continued to occur in September and October. The farms on which the disease prevailed were all in the same neighborhood, but they did not in all cases adjoin each other. During the prevalence of the epidemic four cases of infection occurred among the owners of the animals as the result of either post-mortem cuts or other conditions. The fingers and wrists were the seats of the pustules. All of the cases recovered, but it was after a long and painful illness.

In the history of this outbreak, as given in Bulletin No. XX of the Delaware Experiment Station, the following statement is made in regard to the post-mortem examinations for the purpose of determining the nature of the disease:

POST-MORTEM EXAMINATIONS.

Three post-mortem examinations were carried out by Dr. Eves in August, 1892, before he would express himself; then he said: "Anthrax is the only disease which can, in my opinion, cause the appearances which these cases present."

Then Dr. Pearson, of the veterinary school of the University of Pennsylvania, was called in consultation. Numerous opportunities for post-mortem studies were available and were fully utilized. He confirmed Dr. Eves's diagnosis positively.

Meanwhile sections of various vital organs and blood from both horses and cows were sent to Dr. Ghrisky, a bacteriologist in the department of hygiene, University of Pennsylvania. His tests were thorough and his answer positive that the bacillus of anthrax was present in all specimens. Later Dr. Ghrisky made bacteriological cultures from the milk in the udder of an anthrax carcass. Dr. Kilborne, of the Department of Agriculture in Washington, duplicated this test personally from the same carcasses. Both confirmed the diagnosis of anthrax. Drs. Ghrisky, Pearson, and Eves secured a small amount of material from a malignant pustule on the wrist of a farmer; in this was demonstrated the bacillus of anthrax. This farmer had been poisoned while helping a neighbor in the work of opening and examining an anthrax carcass.

In May, 1893, Dr. Abbott, chief assistant in charge of the department of hygiene, University of Pennsylvania, detected the bacillus in a portion of the spleen of a bull found dead a day before on a farm upon which anthrax raged last season. He demonstrated the correctness of his work by causing death by anthrax in three cases, sheep being the test animals. Dr. Eves had previously diagnosed that anthrax caused the bull's death.

The above experts—two veterinarians and three bacteriologists—are the only ones to whom this particular study has been referred. They have worked independently of each other, were strangers to each other, and had no interest in any way in this matter except to demonstrate the truth. The fact that they unanimously and positively assert that this was an anthrax epidemic places the question above reasonable doubt.

As to the cause of this outbreak among the domestic animals of Delaware, two theories seem to prevail. There are those who place the responsibility on drovers, while another class asserts that the morocco tanners are responsible for the introduction of the disease. In the course of his report on the subject, Prof. Arthur T. Neal, director of the station, says:

CAUSE OF OUTBREAK.

It is known that anthrax has existed for several years in a neighboring county of Pennsylvania, and it is not impossible that an owner who was secretly suffering heavy losses might have been led to save what he could by the hasty sale of an apparently sound animal; for cows, milked at night, without indicating to the milker any noticeable change of condition, have been found dead on the field, anthrax victims, twelve hours later. The possibility that this may have been the way in which anthrax "plants" originated here is not denied, but this theory seems to lack breadth, for many cases of the disease occurred on one farm upon which no cows had been purchased for several years; with few exceptions all then in the herd had been raised by the owner. It is true that indications point to former unreported and unrecognized cases of anthrax in neighboring herds, but these cases have been published by men who wished to prove that anthrax is an old, well-known trouble under a new name, and is not to be dreaded as especially contagious.

The other theory is probable enough to warrant circulation as a warning to farmers that the contagion may have come to them from the city.

This theory is based upon a reliable written statement that the goatskins used by morocco makers are imported in a raw condition from South America, South Africa, China, Asia, and various countries of Europe.

The argument is that anthrax prevails in all of these countries, and that no police restrictions against the sales of anthrax skins exist anywhere except in Germany, possibly in France, and in one or two of the other more advanced European nations.

These imported goatskins are called "raw"; that is, they have been cured with salt, clay, dung, or have been sun dried; the hair still remains in place.

As already stated, if an animal dies of anthrax the blood remains fluid and exudes from all of the natural openings of the carcass. On exposure to the air the anthrax plant, hidden in this blood, dies within a day or two, but prior to death it goes to seed. The skin-curing processes above mentioned would have no effect upon said seed, but would simply put the skins in first-class condition as carriers of vital anthrax seed.

Farmers near Wilmington are reported to be impressed with the value of skin scraps and hair from the morocco factories. It is known that within two or three years it has been customary to haul such waste and to compost it on farms in the immediate neighborhood of those affected by the last epidemic. To make the argument complete, it is necessary to assume that at least one anthrax skin has come into Wilmington, and that scraps of it have been taken to one of the highest lying farms in the infected region. For, given moisture and heat, the anthrax seed can develop in certain soil, can be carried in drainage waters, and can cause the death of stock, either when said stock is pasturing on land over which the drainage flows or when it is obliged to drink water which has percolated through fields dressed with this skin compost.

VITALITY OF ANTHRAX SEED.

Referring to statements made on a previous page as to the vitality of anthrax "seed," or that form in which alone the disease could exist on imported goatskins, it will be seen that years might elapse after the infected skin scraps were used as a fertilizer before the anthrax might appear; for weather, rainfall, and temperature in particular govern this source of contagion. Heavy rains may wash the seed as deep into the soil as the water itself goes, to a depth where temperatures are always below the point at which this seed germinates; as long as they remain there they are, of course, harmless. If dry weather persists, however, the water is drawn up through good soil from a very considerable depth, is evaporated from its surface, and deposits thereby whatever it has brought up in it. Here in the surface soil the temperature conditions are changed and the seed may sprout at once and plants may multiply therefrom, or they may find their way into the animal body still in the form of seed, therein may germinate, and develop an epidemic.

This explains why a protracted drought followed by light rain is characterized as anthrax weather.

It may be regarded also as an explanation why skin-scrap manure applied to corn may give rise to its first anthrax epidemic years later when that field comes into use as pasture land.

As to the proper means of checking the contagion, Professor Neal says:

HOW TO CHECK THE CONTAGION.

(1) By avoiding manurial material from questionable sources and by shunning certain agents which may carry this disease.
(2) By insisting upon the proper disposal of all suspected carcasses.
(3) By following the Pasteur system of inoculation with an attenuated virus.

Enough has been written as to skin scrap and similar products from morocco works. Waste from wool which has been imported, either from certain parts of Australia or from any other infected land, may also be a cause of trouble. Long-continued heat at the boiling point of water, or, better, repeated heatings to the same degree at short intervals, will destroy everything which can cause anthrax. If such a process occurs in the treatment of wool wastes, then such wastes do not fall under the head of dangerous products.

A claim, however, that strange grasses and weeds grow where wool waste is used, supplemented by claims that the seed of these visible plants can be found in imported fleeces, should at all times awaken inquiry; for treatment which would certainly destroy anthrax "seed" would also destroy grass seed, and the proof that the latter survive is a strong evidence that the former, too, would probably escape.

Advice has more than once been given by this station that peat from lowlands, when thoroughly sun dried, is an excellent absorbent to use in dairy stables. Farmers who find dairying more profitable than grain raising are obliged to accept any available substitute for straw. Whenever anthrax is suspected peat and similar dried swamp litter must be shunned, particularly if it comes from lands subject to overflow from streams which run near tanneries, woolen mills, slaughterhouses, or bone-boiling establishments.

SUPPOSED SOURCES OF INFECTION.

As to other sources of infection, possibly the most dangerous is rough post-mortem work carried out without a due appreciation either of the sources of danger or of the absolutely necessary precautions. Until a better explanation is found, the belief will be strong that anthrax was carried last summer more than 1 mile on the boots or clothing of one farmer who helped a neighbor in the work of examining a carcass, for very soon thereafter one of his own cows died of anthrax and several head of both horses and cows were lost at intervals on his farm by this same disease. All intervening farms either escaped entirely for many weeks or lost cases which could be referred directly to contagion carried again by one who aided in post-mortem work.

The German laws are explicit on this point: Official veterinarians alone may examine anthrax carcasses, and in their work they must observe all prescribed precautions.

As a factor in spreading disease the buzzard holds an unknown position. The filthy habits of this bird arouse suspicions that it may be a leading cause of epidemics. The possibility that it can digest not only bacilli, but their seed as well, can not be denied. Experiments carried out with the cooperation of Dr. Leonard Pearson to determine whether spores of anthrax can be found in their excreta after they have access to anthrax carcasses are still in progress. Enough is known to warrant the advice that at the time of an epidemic all carrion likely to attract buzzards should be burned or buried, and the ground under buzzards' roosts should be regarded as possible points of contagion.

The above suggestions refer more especially to ways by which anthrax may be denied access to a herd or flock. After the disease has gained its entrance, then, without doubt, the proper thing to do is to burn the carcasses of victims, the straw which they may have defiled, and the soil and excrements near the body.

Eight railroad cross-ties and about one-half a cord of hard wood was found last August to be sufficient to completely burn a 1,400-pound horse without dismemberment. The time required was, approximately, five hours. All risk of polluting either the air, the soil, or the ground waters can thereby be avoided. Whenever cremation can not be practiced, then deep burial should be the next resort.

Preventive measures are now being made with the Pasteur vaccine virus at the Delaware College. Virus was imported direct from France, but the first experiments, which were on sheep, failed. The protected sheep, previously inoculated with the Pasteur fluids, promptly died when injected with small doses of virulent cultures prepared by Dr. Abbott, of the University of Pennsylvania. A second series of experiments is now in progress with a new virus prepared by Dr. Abbott, who is assisted by Dr. Pearson, of the same institution.

THE DISEASE IN EASTERN AND CENTRAL AFRICA.

In connection with the above, an article from a recent number of the London Morning Post will prove of interest, as it shows that this deadly disease has recently made its appearance among animals in eastern and central Africa, from which a large number of hides and other products of domesticated and wild animals are exported to Europe and to this country. The article is as follows:

The terrible disease which broke out about two years ago north of the equator and devastated the cattle herds of eastern and central Africa appears to have attracted little notice in this country. Its dimensions and disastrous effects might have entitled it to the attention of those interested in cattle disease, and the department of agriculture, when Mr. Chaplin was at its head, did take some measures to obtain information on the subject. The indifference with which the matter was regarded arose, doubtless, from the fact that there was no cattle trade between Africa and Europe, and that no channel, therefore, existed by which the contagion could be introduced to northern countries. This, however, is an assumption which goes too far. No cattle are imported from east Africa, it is true, but there is considerable importation of hides, and this being so, it would seem that there is a strong case for some action on the part of the Government to obtain reliable information on the nature of the disease which has been decimating not merely the cattle, but the game of eastern and central Africa, and to obtain satisfactory assurances—if such assurances are warranted—that the germs of the disease can not be imported by the hides. The plague, after devastating the equatorial regions, has reached Lake Nyassa in the south, and is evidently heading for the Cape.

PROBABLY CARRIED IN HIDES.

Out of a total of 12,228 packages of hides exported from the port of Zanzibar during the year 1892, of the value of 258,912 rupees, no less than 10,986 packages came to Europe, while America took 1,236 packages. London received 1,638 packages, Marseilles 220, Hamburg 8,215, and other European ports smaller quantities. New York and Boston received 1,236 between them. Of the larger number shipped to Hamburg probably the greater part was for transshipment to American or English ports. If, therefore, there is any ground for suspecting that the germs of the disease can be carried by the hides, a strong case arises for inquiry and such action as the results of competent inquiry may call for in the interests of stock owners in England. It is almost superfluous to say that cattle disease is a matter which calls for the closest and most anxious attention of our authorities in whatever part of the world it makes its appearance, and no avenue by which it can possibly approach our shores should escape the strictest vigilance. Many kinds of cattle disease have been met with by travelers in Africa, more or less contagious and destructive in their effects.

One or two may be mentioned by way of illustration, although it will be noticed that in incidence, as well as dimensions, they bear no comparison with the late plague in central and eastern Africa, howsoever analogous they may appear in some other respects. Emin Pasha describes a plague which he witnessed in Latuka in 1881. "Although the abundance of game," he says, "is a blessing to the people, I attribute to it a fact which I could not previously explain; all cattle brought here, and riding animals, such as donkeys, mules, etc., are ruined after a short stay. Swellings on different parts of the body, loss of appetite, emaciation, and, finally, death, follow one another speedily; a combination of symptoms which I attribute to the intrusion of intestinal worms. This view is confirmed by the fact that all the game absolutely swarms with worms. This is always the case in countries where salt is rare." Dr. Schweinfurth observes a somewhat similar state of things among the cattle of the Dinka tribe, also in the White Nile regions. The continual dampness of the pasture, he says, especially during the rainy season, favors the development of revolting intestinal vermes, and rain pools in dry months become most prolific as breeding places for cercariæ. Half the cattle in the country sickened and died with all sorts of intestinal disorders. Dr. Schweinfurth was, however, sure that, notwithstanding these herds were wholly unaccustomed to salt, its use would infuse new life and vigor into them; he attributed the preservation of his own cow to the administration of salt to her regularly. Other forms of cattle disease are mentioned by him, but these cases, as well as that described by Emin Pasha, differ from the recent plague in one very important respect, i. e., they are confined to cattle and domestic animals only, whereas the latter has been equally fatal to such game as the buffalo, whose carcasses travelers have found strewn over the country.

OBSERVATIONS OF THE DISEASE.

With regard to the east African plague, which may almost be said to have swept away every four-footed beast in the immense pastoral regions of the Somauli, Masai, and surrounding tribes, we have some particulars from intelligent witnesses which may prove of interest. In May, 1891, Mr. Rogers, an officer of the East Africa Company, in charge of the district of Witu, on the coast, in reporting the death of seventeen of his bullocks, believed their deaths to have been "undoubtedly from the same disease that is carrying off thousands of head of cattle in the Somauli and Masai countries and elsewhere. Mr. Jackson," he adds, "informs me that he heard from Mr. Gedge that this same disease is raging in Lykipia, in the Masai country, where out of immense herds only a few head are left." The symptoms of the disease are described as follows: A bull leaves the camp at daybreak for grazing, apparently in perfect health, eats steadily for a couple of hours or so and drinks water freely, when suddenly he may be seized with spasms; the limbs become rigid; the animal staggers and falls down; his breathing is very short, quick, and irregular; the entire body, especially the back and stomach, is very hot to the touch, and just before death blood drips from the mouth, nose, and ears, and water from the eyes. An animal thus seized generally dies in the course of half an hour, but sometimes gets over the first attack, moves about in a dazed state for a few hours, is then seized again with spasms and dies. It was also noticed that, since the disease had shown itself, the bullocks ate earth in large quantities, though they were freely supplied with salt. In no case did any animal once seized recover. Every known remedy was tried by Europeans and natives (East Indians), but without success. As an experiment, one animal which was very bad was given an enema of hot soap and water and a draught of a pint of beer; though the animal was almost rigid at the time, it recovered, grazed freely, but died on the following day.

Though the symptoms of the disease were pronounced to resemble pneumonia, cold was not the cause, as all the animals were comfortably housed. A post-mortem examination was made upon two of the bullocks by a medical officer, who, however, did not profess to know anything of veterinary medicines, and described the appearances of the tissues as they appeared to him from his knowledge of human anatomy. It was his opinion that the disease was pneumonia in an epidemic form. In both cases on opening the chest the lungs only collapsed slightly, and there were no adhesions to the chest walls. In one the pleural cavities were dry; in the other they contained a considerable amount of fluid—the left containing more than the right. The lungs were heavy and solid to the touch throughout, pitting on pressure, when a frothy, red serum oozed out. On section, they cut like flesh; and in one case large spots of a considerably darker color than the rest were scattered over the surface, and these on being cut were more consolidated than the surrounding tissue. The heart was well contracted, and all the cavities contained dark clots of blood. The spleen was considerably enlarged.

THE PLAGUE IN ZANZIBAR ISLAND.

In Zanzibar Island horses are subject to an epidemic, which has, it would appear, some relation to the cattle plague on the mainland. The disease is deadly not only to horses, but to every kind of herbivorous animals, to fowls, it is said also to fishes, and, what is still more important, to man. Dr. Charlesworth, the consular medical officer at Zanzibar, has had numerous opportunities of studying this disease, and, in conjunction with the late Captain Fuchs, Austrian consul, "determined, without any doubt whatever," to quote his own words in a recent report, "that this disease is that variously known in England as anthrax, malignant pustule, or splenic fever; in France as charbon, and in Germany as anthrax or milzbrand." As Dr. Charlesworth is of opinion that the tremendous visitation which lately devastated the mainland is the same disease, his remarks upon it are interesting. The most important symptoms he regards to be the preliminary ones, which may last from one to several days, during which the animal is sluggish, extremely depressed and feeble, loses its appetite, and would probably be found to have a very high temperature. This stage he regards as the most important, as it is the only one in which remedial measures have any chance of success. "The germ of anthrax," Dr. Charlesworth says, "undoubtedly exists in the grass in certain districts. When the land is once infected with these disease producers, drainage and cultivation appear to be the only means of getting rid of them. They appear to become much more numerous in wet and damp weather. It is important to point out that it is not the dampness of the grass that constitutes the danger, but the germs which accompany it." The most significant statement made by Dr. Charlesworth is that this fatal disease is not only highly contagious, but that grass is not the only means of conveying contagion; water, and everything that has come in contact with a diseased animal, may do so. All carcasses should be burned, as well as stable utensils, etc., and wood flooring and

other woodwork of stables. It appears somewhat doubtful whether any serious attempt is made by Arabs to take due precautions in such cases. It is even said that the slaughter of diseased animals is contrary to Mohammedan faith, or, at any rate, the slaughtering of them in any way except in accordance with Mohammedan customs. In such an epidemic as that which has ravaged the mainland, and is now extending toward the Cape, precautionary measures are out of the question. But in view of the opinion of Dr. Charlesworth that the disease on the island and the mainland is the same, and that everything that has been in contact with a diseased animal will convey the contagion, it becomes a serious question how far it is safe to continue importing from the infected regions large quantities of hides, many of which may have been taken from diseased animals. There is, at any rate, a case for competent inquiry and investigation by an expert, and the Department of Agriculture might usefully give its early attention to the expediency of obtaining full and reliable information on the spot by a qualified veterinary surgeon. The time is past when we could afford to run risks.

THE DISEASE IN GREAT BRITAIN.

In the annual report of the veterinary department of Great Britain for the year 1892 the director thus speaks of the prevalence of anthrax among the domesticated animals of that country during the past year, and of the efforts of the authorities to check its spread:

ORIGIN IN THE KINGDOM UNKNOWN.

From remote times anthrax must have existed in this Kingdom, but no restrictive measures were adopted to check its spreading until 1886, when, in concession to the requests of local authorities, this disease was included in the list of maladies which come under the provisions of the contagious diseases (animals) acts. Of the origin of anthrax nothing is known, but of its antiquity no doubt can be entertained. Under various names it is referred to in the oldest records, and from our knowledge of the nature of the malady and its mode of propagation, there is nothing to justify a hope that it will ever be extinguished. To the scientist anthrax is a subject of inexhaustible interest. Dr. Burdon Sanderson quotes the discovery of the anthrax bacillus by Pollender in 1855 as the starting point of bacteriology. The malady is the first in reference to which it could be asserted that minute organisms could be found in the blood and tissues of diseased animals. To the stock owner the fact that anthrax is due to the entrance into the blood of a minute rod (bacillus), which is one of the large family of fungi and grows from spores or seeds, must be very significant, because he will at once recognize that it is almost impossible to prevent those microscopic organisms from entering his stables and fields. Any substance which is brought onto a farm may act as a carrier of the infecting agent; fodder, litter, manure, whether from home or foreign sources, may contain the spores. A water course may carry the poison; in fact, the channels through which the infecting agent may be conveyed to the susceptible animal are beyond calculation.

Diseased animals do not transmit the infection to others in the ordinary way—by association. The organism on which the disease depends must be introduced into the blood through a wound, however small, or an abrasion, however slight, before the affection is communicated, and it may be said without exaggeration that a carcass of an animal dead of anthrax is more dangerous than the diseased animal was at any time during life.

At the urgent solicitation of various local authorities, an order was passed on September 16, 1886, giving them powers to regulate the movement of animals from premises on which anthrax had broken out and to cleanse and disinfect premises where diseased animals had been kept; also to dispose of carcasses of animals dead of anthrax by burial or other means. No powers were given to slaughter, as animals when attacked die so suddenly that slaughter could rarely be enforced, and the slaughter of animals in contact would be wasteful, as the disease often ceases after one or two animals have died.

In some parts of the country, however, the disease has a constant existence, and certain pastures became so contaminated that periodical losses inevitably occur. In other instances the affection does not reappear for years.

POWER GIVEN TO SLAUGHTER INFECTED ANIMALS.

Many local authorities expressed a desire that power should be given to slaughter and pay compensation, on the ground that in some cases the disease might be stamped out on premises where only a few animals were kept with less inconvenience than attends the ordinary methods of isolation until the disease has ceased. To meet

these views an order was passed at the end of 1892, and came into operation in the beginning of 1893, including horses, asses, and mules as animals which may be attacked, as well as cattle, sheep, and swine, and giving power to local authorities to slaughter, but allowing the owner to appeal to the board of agriculture if for any reason he should deem slaughter to be undesirable.

So far as is possible to judge from the returns of cases of anthrax in farm stock, the regulations which have been in force since 1886 have done little or nothing to check the disease. In fact, we had in 1892 a larger number of counties infected and considerably more animals attacked with the disease than at any period since 1886. In 1891 anthrax existed in 38 counties in England and 12 in Scotland, while in 1892 there were 44 counties in England, 1 in Wales, and 15 in Scotland in which the disease existed during the year.

There is ample evidence of the spreading of anthrax through ignorance of its existence. An animal is found dead in a field, the hide is removed and sent to the market, the carcass is cut up and given to the pigs or is taken uncovered in a cart to a knacker's yard or a slaughterhouse to be destroyed or utilized, and thus the spores of the anthrax organism are diffused. By chance a veterinary surgeon may see some of the diseased parts and recognize the malady, but in the majority of cases nothing is known until outbreaks of the disease occur and are traced to the movement of a carcass or its consumption by swine on the premises where the animal died.

In the anthrax order of 1892 local authorities are instructed to avoid as far as possible effusion of blood in slaughtering diseased animals or when providing for the destruction of the carcasses of animals dead of the disease. Burial of uncut carcasses with a sufficient covering of quicklime is the most simple and effective method of disposing of them. The organisms soon die when the access of air is prevented. But when the carcasses are destroyed by burning or boiling it is generally necessary to cut them in pieces first, and this process is not only dangerous to the persons employed, but is calculated to spread the disease unless the utmost caution is observed and disinfectants are freely used.

EXTENT OF PREVALENCE.

The disease has prevailed to a much greater extent in England and some of its dependencies during the present year than in the year 1892. From the English journals devoted to the interests of agriculture it is shown that there were thirty-eight outbreaks during the month of January, 1893. In these outbreaks there were 83 animals affected. Three of these recovered, 4 were killed, and the remainder died. During the year outbreaks, resulting in a mortality of a large majority of the animals attacked, occurred in the following localities in England, Scotland, and Ireland: Spalding, in Lincolnshire; Kingsclere Division of Hampshire, Aberdeenshire, Fifeshire, Perthshire, Wigtownshire, Elgin, Linlithgow, Perth, Fonfar, Roxburgshire, Dumfries, Kirkcudbright, Ross, Damside, Dunnichen, Mid-Lothian, Hartwell Hall, in Staffordshire; Lanarkshire, and Stirling.

From one to five outbreaks occurred in many of the localities above named. In the six weeks ended on February 11, 1893, there were 48 fresh outbreaks, in which 118 animals were attacked. In the corresponding period of 1892 there were 34 outbreaks, and 51 animals attacked. In the twenty-eight weeks ended July 15, 1893, there were 256 fresh outbreaks of the disease, during which 590 animals were attacked. In the corresponding period of 1892 there were 141 outbreaks, and 320 animals attacked.

On June 30, 1893, the judges of the first division of the court of sessions ordered issue for trial by jury of an action by James McAdam, cattleman, Kirkland, Terregles, Kirkcudbright, against Thomas McWilliam, farmer, Kirkland, in which pursuer sued for £242 13s. He was in defender's service, and states that on the 11th of March last, upon defender's orders, he cut up the carcass of a bullock which had died of anthrax. He was, in consequence, infected with anthrax, and had since been in Dumfries and Galloway Royal Infirmary. He believed his right arm was permanently injured. The work, he alleged, was outside his

regular duties, and was known to the defender to be a dangerous one. He claimed £200 as damages for injuries, and the balance as wages and rent for the current year.

From the Mark Lane (London) Express of September 4, 1893, the following items relating to the prevalence of the disease during the present year in Great Britain are taken:

OUTBREAK THE PRESENT YEAR.

There has been a fresh outbreak of anthrax at Elmswell, East Yorkshire, where 30 beasts last week succumbed to the disease. The fresh cases are on an adjoining farm, and near a barn where the first infected beast was slaughtered before the nature of the disease was known. One beast and two pigs that ate some of the remains of the slaughtered animal have died, and some other pigs in the neighborhood that were fed with the carcass, are reported to have died.

Anthrax has broken out in Cheshire on the farm of Mr. Thomas Newport, of Utkington, near Tarporley. One animal has died from the disease, and rigorous measures are being adopted to prevent its spread to the valuable herds of dairy cattle in the district. For several months there have been repeated outbreaks of anthrax on the farm of Mr. T. Bassett, of Tittensor, near Trentham. In all, 10 animals have died from the malady, and the farm is under the continuous supervision of the police authorities and their veterinary inspectors. On Wednesday a well-marked case of anthrax in a pig was reported from Aldridge, near Walsall, and a suspicious case, also in a pig, has occurred at Keele, in North Staffordshire.

A supposed case of death from anthrax has been reported to the Worcester coroner. Edwin Hodges, aged 14, employed at Messrs. Webb's horsehair factory, was admitted to the infirmary about a week ago, and died on Friday the 25th ultimo. It is believed that the disease was communicated from hair used at the manufactory to a small pimple on the boy's face, and developed so rapidly as to prove fatal

THE DISEASE IN AUSTRALIA, AND PASTEUR'S METHOD OF VACCINATION.

The Secretary of State recently furnished the officers of the Delaware Agricultural College and Experiment Station with a copy of a communication from Hon. George H. Wallace, late United States consul-general at Melbourne, relating to the prevalence of anthrax in Australia, and the efforts being made there for its extirpation. This communication, for an advanced copy of which the Bureau of Animal Industry is indebted to the officers of the above-named institution, bears date of Melbourne, Australia, July 24, 1893, and is addressed to Hon. Josiah Quincy, Assistant Secretary of State. It is accompanied by a number of inclosures, giving, in detail, the results of a series of experiments with Pasteur's method of vaccination for the suppression of anthrax. The communication is as follows:

FIRST APPEARANCE IN AUSTRALIA.

The first outbreak in Australia of what is clearly recorded as being that of anthrax occurred on a farm belonging to Mrs. Cordeaux, at Leppington, in the county of Cumberland, colony of New South Wales, in 1847, and from the county the disease took its name as the Cumberland disease. The ravages of the disease became so great that a commission was appointed in 1851, under the direction of Sir Edward Deas Thompson, to inquire into its nature, and to offer such suggestions for its suppression as should seem best. This commission reported, as a fact, that the symptoms, course, and post-mortem appearances of the disease were in all respects "similar to a disease long known in France under various names, of which the most common is the 'maladie du sang.'" In 1855 M. Pollender demonstrated that anthrax was always accompanied by the presence of rods or filaments in the blood of diseased animals. In 1857 Brauell discovered the rods in the blood of a diseased animal before death, and also in the human subject after death. In 1861 and 1862 Pasteur made known his discovery of the butyric ferment, the bacillus subtilis or amylobacter, and showed that this wand-shaped microbe or bacillus was the sole and active agent in the process of butyric fermentation.

M. Devaine experimented by inoculating some sheep with a liquid containing the rods, and produced the disease with its accompanying fatal results, and again beheld the rods or bacilli in the blood of the dead animal.

In 1868 Mr. Gordon, chief inspector of stock in Queensland, became satisfied as to the identity of the anthrax of Europe with the Cumberland disease in Australia.

PROTECTIVE VACCINE.

In 1877 Pasteur proved that the bacilli are the direct and active agents in producing the disease, and in 1881 came the discovery of a protective vaccine by Pasteur, who, with Chamberland and Roux, were the originators of the method of protective vaccination against anthrax. Mr. Anthony Willows reports to the Government in 1883—confirming the diagnosis—that the Cumberland disease was identical with the European maladie du sang, known likewise as splenic fever, or anthrax, and he was the first in Australia to advocate vaccination as a protection against the disease. Mr. W. E. Abbott, of Wingen, New South Wales, in a letter to the Sydney Morning Herald, April 3, 1883, strongly urged Pasteur's method of protective vaccination. In 1885 Mr. Edward Stanley, Government veterinarian, in reporting upon an outbreak of the disease at Narandera, recommended Pasteur's method, but nothing was done in regard to it, as Mr. Alexander Bruce, the chief inspector of stock, in the absence of full information, could not recommend it. In 1888 the representatives of M. Pasteur came to Australia to deal with the rabbit plague, and Drs. Germont and Hinds visited Narah Station and saw a sheep that had just died of the disease. As the result of their examination, they unhesitatingly pronounced the disease to be the same as that known in France as maladie du sang, charbon, sang de rate, etc.

Some attenuated virus was obtained from M. Pasteur and arrangements were made to have it tested officially and in as public a manner as possible upon a number of sheep.

Stockmen and squatters had agreed in attributing the disease to plants or herbage the sheep may have eaten, and a large number of specimens of plants were submitted to the Government analyst for examination and analysis. But these steps failed to clear up the mystery, and direct practical tests with the plants on the sheep themselves gave no support to the theory. Pasteur made some interesting experiments in this direction. He found that food that had been infected with virulent virus of anthrax was not always fatal to sheep, and that the majority of the sheep so fed did not contract the disease. But on mixing virulent virus with dry barbed ears of barley, oats, thistles, and chaff, the mortality rose at once to 80 and 90 per cent, proving beyond all question that the abrasion and irritation caused by the sharp points of the plants at once gave the necessary conditions and placed the animal in reach of the disease.

Mr. Willows, in reporting upon an outbreak of the disease on the Lachlan, said: "I found much of the grass of the Lachlan district to be very penetrating, hard and fine in its fiber, and the terminal extremities of the seeds were quite prickly in many instances, and I observed that many of the sheep were feeding upon thistle seeds." "Vaccination against anthrax is accomplished by injecting, hypodermically, 4 minims of an attenuated virus of a known strength, obtained by cultivation from the blood of an animal suffering from the disease." "A mild attack of the disease is set up, not enough to produce any discomfort to the animal, imperceptible, indeed, except for the rise in temperature, the increase being from 103° F., normal sheep's temperature, to 105° F., or perhaps 106° F. This constitutes the first vaccination, and of itself is not sufficient to insure the certain protection of the sheep or cattle." The second vaccination is performed some fifteen days after, with the virus of increased strength.

On the 4th of September, 1888, 20 sheep and 4 cattle were submitted to a first vaccination by Dr. Germont. The part of the animal selected was the inner side of the right thigh. The surface was first washed with water containing a few drops of carbolic acid, and about 2 minims of the vaccine injected under the skin by means of a small sterilized Pravaz syringe. Temperature of the sheep registered 103° to 104° F. In forty-eight hours the temperature rose about 3° F., gradually falling to normal.

On the 18th of September these sheep were again vaccinated by Dr. Germont, the general average rise in temperature being about 4° F.

The test inoculation was arranged to take place on the 2d of October, the sheep being timed to die on the 4th. Nineteen healthy sheep were let loose into the yard with 20 vaccinated sheep; the whole 39 were then inoculated alternately with 2 minims of blood, obtained direct from a sheep that had just died from anthrax.

RESULTS OF VACCINATION.

The results were clear and unmistakable. Every one of the 19 unvaccinated ones died within a period averaging forty-eight hours, while the 20 vaccinated sheep walked about among the dead, eating contaminated food, unhurt, and in perfect health.

Of the cattle, 4 were vaccinated on the 4th and 18th of September at the same time and place. Two unvaccinated ones were obtained and all 6 were inoculated on the 2d of October just after the sheep. Results, 1 of the unprotected cattle died and the other recovered after a severe illness. The 4 vaccinated animals showed no signs of inconvenience from the inoculation.

The above is an abstract of the history of Cumberland disease, as it is called in Australia, from the earliest recorded outbreak down to the official test at Junee of the efficacy of Pasteur's method of vaccination for the prevention of the disease.

The subject was one for earnest discussion and study by the veterinarians and squatters of the colonies, and at a meeting held at Doyle's Hall, Junee, October 3, after the experiments were held, many pertinent questions were asked and answered by the specialists present, among which may be noted the following:

"Question. Whether it was dangerous to introduce into sheep on sound country?

"Answer. It might not be wise to vaccinate in a country where the disease did not exist, as there might perhaps be a possibility of a vaccinated sheep dying, and if not at once burnt it could contaminate the soil; still the risk altogether is small.

"Question. What effect climatic influence had on the development of the disease, and whether dry weather would destroy the germs?

"Answer. Warm, moist, spring weather favored the growth of bacilli. The spores (seed germs) are practically indestructible; they lie latent, but retain their vitality through very dry seasons. In France the disease is quite as prevalent in dry as in swampy country. The bacilli could not grow in a temperature of less than 65° F., nor more than 108° or 110° F., but the spores or seeds retained their vitality beyond these limits.

"Question. Is the disease infectious and contagious in the ordinary sense of the term?

"Answer. It is to a certain extent both infectious and contagious, from the fact that the disease is communicated to sound country by the discharges of infected sheep, and thousands of spores escape from one dead body.

"Question. How long will the protection last?

"Answer. At least twelve months; some sheep can be protected for many years.

"Question. Is there any danger of infected traveling sheep leaving disease which might affect sheep following them?

"Answer. It may be that such sheep dying, spread spores which will germinate sooner or later; so it is dangerous."

Mr. Stanley stated that "it all depended on the soil and country they traveled over. On some stony, rough country the spores were killed outright, while if distributed in suitable places the spores developed bacilli, or they may reproduce spores living on vegetation apart from an animal. It is when the spores are eaten with herbage in certain favorable seasons that they prove so fatal to sheep.

"Question. Does the vaccine increase or decrease in potency with time?

"Answer. A cultivation which has been maintained for some days at the spore-preventing temperature (107° to 109° F.) will become, as it is called, attenuated; that is to say, it gradually ceases to possess virulence, and at one particular stage possesses the property of protecting animals against the virulent virus of anthrax. As age increases the virus gradually loses even this property, and finally becomes inert. Not so with the spores, whose vitality, on the other hand, is maintained for years, even when dried to a fine dust."

PASTEUR'S METHOD RECOMMENDED.

After carefully watching the whole series of experiments and giving the subject the fullest consideration, the official board reported that they were "unanimously of opinion that the efficacy of Pasteur's vaccine of anthrax as a preventive against that disease had been demonstrated, and they therefore recommended its adoption and use."

The official record of observations at the Junee test is as follows:

Record notes of animals vaccinated with first vaccine at Junee, while under observation, September 4, 5, and 6, 1888.

SHEEP.

Mark.	Sex.	Age.	Temperature.		
			Sept. 4.	Sept. 5.	Sept. 6.
225	Wethers	2-tooth	103 2	104. 0	103. 0
227	do	6-tooth	103. 8	104. 0	103 0
228	do	do	103. 4	104. 6	106. 0
229	do	4-tooth	104. 2	104. 8	104. 8
230	do	do	103. 4	104. 4	104. 0
231	do	do	103. 2	103. 4	102. 4
232	do	do	104. 0	103. 8	103. 6
233	do	do	103. 6	106. 2	104. 0
234	do	do	103. 8	104. 6	104. 2
236	do	6-tooth	103. 2	104. 8	104. 6
237	do	do	103. 0	103. 2	103. 4
238	do	8-tooth	103. 0	103. 4	104. 6
239	do	6-tooth	103. 0	103. 0	102. 8
240	do	do	103. 0	104. 0	104. 0
241	do	4-tooth	104. 2	104. 4	104. 0
242	do	6-tooth	103. 6	103. 2	104. 6
243	do	4-tooth	103. 6	103. 8	104. 4
244	do	6-tooth	104. 0	104. 6	103. 4
246	do	do	103. 6	103. 0	104. 6
247	do	do	104. 0	104. 2	103. 0
Mean			103. 54	104. 07	103. 92

CATTLE.

41	Cow	Aged	102. 0	101. 8	102. 0
55	do	4 years	102. 2	101. 4	102. 0
22	do	3 years	104. 8	102. 0	101. 8
77	do	do	102. 0	101. 8	101. 8
Mean			102. 75	101. 75	101. 9

Record notes of animals vaccinated with second vaccine at Junee, while under observation, September 18, 19, and 20, 1888.

SHEEP.

Mark.	Sex.	Age.	Temperature.		
			Sept. 18.	Sept. 19.	Sept. 20.
225	Wethers	2-tooth	103. 0	105. 8	103. 0
227	do	6-tooth	103. 4	105. 0	103. 0
228	do	do	104. 0	103. 2	103. 0
229	do	4-tooth	104. 8	107. 0	104. 8
230	do	do	104. 8	106. 0	104. 0
231	do	do	103. 6	105. 0	102. 8
232	do	do	103. 4	105. 0	103. 8
233	do	do	104. 0	104. 0	102. 8
234	do	do	103. 6	104. 0	103. 6
236	do	6-tooth	103. 0	104. 0	102. 4
237	do	do	103. 0	103. 2	102. 8
238	do	8-tooth	102. 6	103. 0	102. 8
239	do	6-tooth	103. 1	104. 0	104. 4
240	do	do	103. 6	104. 0	102. 8
241	do	4-tooth	103. 4	107. 0	103. 2
242	do	6-tooth	104. 0	103. 0	103. 6
243	do	4-tooth	104. 6	104. 6	105. 2
244	do	6-tooth	103. 8	105. 0	103. 0
246	do	do	104. 0	104. 6	104. 0
247	do	do	103. 8	106. 0	.....
Mean			103. 63	104. 67	103. 4

Record notes of animals vaccinated with second vaccine at Junee, etc.—Continued.

CATTLE.

Mark.	Sex.	Age.	Temperature		
			Sept. 18.	Sept. 19.	Sept. 50.
41	Cow	Aged	102.4	102.4	102.0
55	do	4 years	102.0	102.0	102.2
22	do	3 years	101.8	101.8	102.2
77	do	do	102.4	103.0	102.3
Mean			102.15	102.37	102.17

Table showing deaths of nineteen unprotected sheep.

No.	Date of death.	Time.	No.	Date of death.	Time.
2	Wednesday, October 3	8.15 p. m.	4	Thursday, October 4	5.45 a. m.
7	do	8.26 p. m.	18	do	6.15 a. m.
15	do	10.44 p. m.	1	do	7 a. m.
14	do	11.25 p. m.	3	do	12 m.
11	Thursday, October 4	12.55 a. m.	9	do	3 p. m.
19	do	1.40 a. m.	17	do	3 p. m
6	do	1.45 a. m.	16	do	5.30 p. m.
13	do	2.05 a. m.	8	do	6.15 p. m.
12	do	2.35 a. m.	5	Friday, October 5	5.30 a. m.
10	do	3.40 a. m.			

Of the two unprotected cattle, one died on October 7; the other, though very ill, recovered.

A list of questions was formulated and sent to the secretaries for agriculture of the colonies of Victoria, South Australia, New South Wales, and Queensland, in regard to the use of the Pasteur vaccine of anthrax (see report C. E. Corney, inspector of stock at Wahgunyah, Victoria) and the replies received are hereto annexed as exhibits.

I very much regret that I have been unable to obtain a copy of the official report of the experiments at Junee, to forward with this report (as it is probably out of print) but I have endeavored to give the main facts in full from the copy loaned me.

A few days since I fortunately met the owner of the 15,000 unvaccinated sheep spoken of by Mr. Corney in his report, and he was most enthusiastic in his praise of the vaccine as a preventive, and stated that his loss had been an object lesson to himself and his neighbors, who had heretofore doubted its efficacy.

The letter of the acting chief inspector of stock for New South Wales says there are "no reports or bulletins published of the experiments and results at the Rodd Island Bacteriological Laboratory at the present."

EXHIBITS.

A, No. 1. Letter from secretary, Victoria.
A, No. 2. Letter from inspector of stock, Victoria.
A, No. 3. Report, C. E. Corney.
A, No. 4. Questions and answers.
A, No. 5. Extract report, L. Watson.
B. Letter from secretary, South Australia.
C. Letter from inspector, Queensland.
D, No. 1. Letter from inspector, New South Wales.
D, No. 2. Extract report, 1892, New South Wales.
D, No. 3. Extract report, 1393, New South Wales.

G. H. WALLACE,
United States Consul-General.

UNITED STATES CONSULATE-GENERAL,
Melbourne, Australia, July 21, 1893.

[EXHIBIT A, No. 1.]

DEPARTMENT OF AGRICULTURE,
Victoria, Melbourne, July 6, 1893.

SIR: In reply to your letter of the 31st May, last, relative to anthrax and the use of virus as a preventive measure in this colony, I have the honor to forward the

inclosed copies of reports furnished by the acting chief inspector and one of the inspectors of stock on the subject, and I shall be pleased to know that the information contained therein will be of assistance to you.

I have the honor to be, etc.,

D. E. MARTIN,
Secretary for Agriculture.

G. H. WALLACE,
United States Consul-General, Melbourne.

[EXHIBIT A, NO. 2.]

CUSTOM-HOUSE,
Victoria, Melbourne, June 21, 1893.

SIR: In accordance with your minute of the 7th instant, on papers numbered as per margin, I have the honor to report that anthrax, except in a few isolated cases, is unknown in Victoria, consequently Mr. Pasteur's discovery of inoculation with cultivated virus has not been tried in the colony.

Being unable to reply to Mr. Wallace's questions, I asked Inspector Corney to kindly obtain for me information on the subject, as Junee, in New South Wales, is not far from his crossing, and his report on the subject I forward herewith.

It would appear from the report and pamphlets forwarded that stock owners who have inoculated their flocks with cultivated virus believe in its efficacy.

That the danger of spreading the inoculated disease is only in the case of animals dying and their remains being left unburnt.

That the cultivated virus soon loses its potency, but a fresh supply can be easily obtained.

I have the honor to be, etc.,

W. H. STEPHEN.

SECRETARY FOR AGRICULTURE.

[EXHIBIT A, NO. 3.]

WAHGUNYAH, AUSTRALIA, *June 19, 1893.*

SIR: I have the honor to report on the use of M. P[illegible]teur's vaccine of anthrax.

It is extremely hard to get an unprejudiced opinion from stock owners as to the efficiency of the vaccine in protecting sheep from anthrax, as the majority of owners of infected country will not give any information about it, in fact will not admit they have the disease for fear of decreasing the value of their properties (as you will see by copy of report by Mr. T. Watson, inspector of stock at Cowwa, New South Wales, attached), but there are many instances where it has been tried and where the owners do not mind giving their experiences, but will not have their names or the names of their properties used. I will quote some instances that have come under my notice. One Riverina stock owner was losing annually 8 per cent of his sheep through anthrax, when in 1890 he had all his sheep (more than 25,000) vaccinated, and at once reduced his death rate to less than 1 per cent, and since that time he has each year had his lambs vaccinated, and the death rate is still less than 1 per cent. A great test was proved on this station last year, when another stock owner with unvaccinated sheep sent 15,000 of them to this station for grass and he lost 2,500 of them from anthrax, while the vaccinated sheep with only wire fences separating them were not affected in the least. This shows that the germs remain in infected ground for years. Another stock owner with about 9,000 sheep was losing over 20 per cent of them annually from this disease, and he also had them all vaccinated in 1890, and his lambs each year since, and his death rate is reduced to less than 5 per cent from all causes. I could quote many other instances of benefits derived from vaccination if necessary.

I am sending you a copy of report on experiments at Junee, and other papers relating to the use of the vaccine (which I have only borrowed, so will have to ask you to return them when you have done with them). I also attach answers to the questions asked. The answers are derived from information given by various stock owners and from Mr. A. A. Devlin, of Junee, Mr. Pasteur's Australian agent for his vaccine of anthrax. He does not advertise, so I could not get any slips, but his prices are 2½d. per sheep for flocks of 15,000 and over up to 3½d. per sheep for flocks of 2,500 or under.

I have the honor to be, etc.,

C. E. CORNEY,
Inspector of Stock.

W. H. STEPHEN, Esq.,
Acting Chief Inspector of Stock, Melbourne, Australia.

[EXHIBIT A, No. 4.]

ANSWERS TO QUESTIONS IN REGARD TO THE USE OF M. PASTEUR'S VACCINE OF ANTHRAX.

Question. Public opinion ruling among stock owners as to the efficiency of the attenuated virus in combating anthrax.

Answer. As far as can be ascertained the opinion among stock owners is that vaccination with M. Pasteur's vaccine for the protection of sheep from anthrax is a decided success

Question. What dangers are to be dreaded, i. e., whether experience has demonstrated in Australia that the attenuated virus either loses or increases in potency with time?

Answer. No dangers are to be dreaded. The attenuated virus loses its potency with time, and this has been the difficulty about its use, but this difficulty has been overcome, and now M. Pasteur's agents here have better vaccine than during 1890 and 1892.

Question. The risk that the use of such virus involves in spreading the disease through excreta, etc.

Answer. There is no risk of spreading disease with the virus if it is only used on infected country; it is only when death results from the vaccination that any virulent germs are produced, and the death rate from vaccination is so small that it is easy for stock owners to burn the few carcasses of sheep which die and so destroy the germs therein.

C. E. CORNEY,
Inspector of Stock.

WAHGUNYAH, *June 19, 1893.*

[EXHIBIT A, No. 5.]

COPY OF REPORT ON ANTHRAX BY MR. T. WATSON, INSPECTOR OF STOCK, COWWA, NEW SOUTH WALES, AND FURNISHED BY HIM TO THE CHIEF INSPECTOR OF STOCK, SYDNEY.

Question. Whether the sheep have been affected by anthrax?

Answer. Yes; more or less all over the district, with a few exceptions. On three out of four holdings where Pasteur's inoculation was used there have been no deaths, but on the other holdings, where half the stock were protected, the loss on the inoculated and otherwise is about the same, 15 per cent.

It is very hard to get any information on the subject of this disease, as owners think that to acknowledge that it exists on their holdings decreases the value of their property, but from what I have seen and heard it has been very bad this year and is still on the unprotected holdings. It was worse this year at shearing time than in former years and not so bad in November and December, and it does not seem to be so severe on long-wool and crossbred sheep as on Merino.

[EXHIBIT B.]

OFFICE OF THE MINISTER OF AGRICULTURE AND EDUCATION,
Adelaide, June 14, 1893.

SIR: In reply to your letter of the 31st ultimo, I am directed by the honorable the minister of agriculture and education to inform you that anthrax has not made its appearance in the Province of South Australia, consequently the virus (attenuated) has not been used. No opinion has been expressed by stock owners as to its efficacy or otherwise.

The chief inspector of stock, to whom your communication was referred, states that he would have no hesitation in recommending the use of attenuated virus as a preventive measure in the event of anthrax making its appearance among the stock in this colony.

I have the honor to be, etc.,

JAMES BATH,
Secretary, Minister of Agriculture and Education.

[EXHIBIT C.]

OFFICE OF CHIEF INSPECTOR OF STOCK,
Brisbane, June 8, 1893.

SIR: The secretary for agriculture has handed me your letter to him of 31st May, requesting an opinion relative to anthrax virus prepared by M. Pasteur and used commercially as a preventive measure, and has requested me to reply thereto.

I have, therefore, the honor to inform you that true anthrax does not exist in this colony at the present time, but should it at any time appear in the colony I have not the slightest doubt but that it would be availed of by our stock owners, as its efficacy as a prophylactic is universally believed in here.

We have no reports on the subject beyond those which you will have received from the New South Wales authorities.

I have the honor to be, etc.,

P. R. GORDON,
Chief Inspector of Stock.

GEO. H. WALLACE, Esq.,
United States Consul-General, Melbourne, Victoria.

[EXHIBIT D, NO. 1.]

DEPARTMENT OF MINES, STOCK, AND AGRICULTURE,
Sydney, June 9, 1893.

SIR: I am directed by the secretary for mines and agriculture to acknowledge receipt of your letter of the 3d instant respecting M. Pasteur's virus for anthrax, and asking for any reports or bulletins published of the experiments and results at the Rodd Island Laboratory.

In reply I have the honor to state that there are not any reports or bulletins published of the experiments and results at the Rodd Island Bacteriological Laboratory, but the attenuated virus for prevention of anthrax has been used upon several holdings with good effect, having very considerably reduced the losses among sheep, which, prior to using the virus, prevailed upon the holdings referred to.

I would refer you to the accompanying copies of the reports of this branch for 1891 and 1892 for fuller particulars, which are forwarded herewith.

I have the honor to be, etc.,

WM. D. TOWER, (?)
Acting Chief Inspector of Stock.

Gen. W. KAPUS,
Consul for the United States, Sydney.

[EXHIBIT D, NO. 2.]

[Extract from stock report of New South Wales for the year 1891.]

Statement showing the result of vaccination for anthrax during the year 1891.

Lots vaccinated.	Number of sheep vaccinated.	Were any dying when vaccinated?	Number of vaccinations.	Number of deaths after first vaccination.	Number of deaths after second vaccination.	Number of deaths after third vaccination.	State of weather during operation.	Number of deaths by failure of operation.
1	9,000	No	First and second				Fine	
2	350	No	do				do	
3	500	No	do				do	
4	6,000	No	do				do	
5	6,000	No	do				do	
6	2,000	No	do				do	
7	1,000	No	do				do	
8	15,000	No	Second	10	15		Cold, wet, and windy	
	22,000	No						
9	4,000	No	First and second				Cool to cold	
10	10,500	No	do				do	
11	700	No	do				do	
12	3,900		do			340	Not stated	340
	8,311		Second					
Total	98,261			10	15	340		340

[EXHIBIT D, NO. 3.]

[Extract from stock report of New South Wales for the year 1892.]

Statement showing the result of vaccination for anthrax during the year 1892.

Lots vaccinated.	Number of sheep vaccinated.	Were any dying when vaccinated?	Number of vaccinations.	Number of deaths after first vaccination.	Number of deaths after second vaccination.	Number of deaths after third vaccination.	State of weather during vaccination.
1	5,868	No	First and second		200		Moderately cool and occasionally showery.
2	1,204	No	do		9		Do.
3	2,500	No	First only				Wet and cold.
4	11,226	No	First and second		45		Hot.
5	2,400	No	do				Cool and fine.
6	7,590	No	do				Do.
7	500	No	do				Do.
8	1,600	Yes	do				
9	6,323	Yes	do				
10	3,186	Yes	do				
11	1,146	Yes	do		1		
12	688	Yes	do				
13	1,700	Yes	First	50			
14	98	Yes	do				
15	7,000	Yes	Third				Wet.
	8,000	Yes	First and second				Do.
16	9,000	Yes	do				Mild and dry.
Total	70,029			50	255		

EXTIRPATION OF MALADIE DU COÏT.

BALTIMORE, MD., *December 1, 1893.*

SIR: I have the honor to submit the following as my report of work done in Nebraska and South Dakota in stamping out maladie du coït.

Very respectfully,

GEO. C. FAVILLE, D. V. M.,
Veterinary Inspector

Hon. J. STERLING MORTON,
Secretary of Agriculture.

We arrived at Gordon, Nebr., June 23, 1893, and at once began work. The work I did in 1892 in the investigation of this disease and the work done by Mr. Edward Shelden just prior to our visit enabled us to at once begin the slaughter of diseased mares. We found that a very large proportion of the mares I found diseased in my investigations of last year had died.

Taking the service book of one stallion described in my report of last year as the property of M. Swigert, we found that of the mares bred after the horse was known to be diseased 26 out of 39 had died. We killed 13.

This is a fair proportion for all those horses known to have been diseased. I described the appearance of the disease fully in my report last year. The history of a few cases will show the character of the disease as seen at this time:

HISTORY OF CASES OBSERVED.

Case 1.—Bay mare, 10 years old, the property of Leonard Dean; was bred to Swigert's horse May 27, 1891; was taken sick about two months afterwards and showed a weak, staggering gait; coat rough and staring and a muco-purulent discharge from vulva. Now shows a perceptible weakness in posterior limbs, the vulva showing a white incrustation, which, upon being rubbed off, leaves white spots more or less confluent. Clitoris protruding and hard to the feel. No discharge.

This mare was purchased and killed. Post-mortem showed, besides the conditions mentioned above, a thickened fibrous clitoris; the mucous membranes of vagina thickened and a large quantity of mucus in the uterus, the os uteri being surrounded by a yellowish gelatinous deposit. Fibrinous bands extended from the liver, spleen, and other abdominal organs, to the peritoneal lining of the abdominal cavity. Ovaries enlarged and made up of a number of sacs containing a serous deposit.

Case 2.—A gray stallion, 7 years old, property of Roy Beckwith, 12 miles south of Gordon. This horse was described in my report of last year. At that time he was greatly emaciated and showed acute symptoms of the disease. At the present time the horse is in excellent condition. When brought near the corral of mares, he seems as amorous as any other stallion would be. The penis when protruded is of a papery white appearance, and shows a yellowish scaly "scurf" over its entire extent. Near the glands there are numerous petechial spots, and about the middle there are several ulcers, red, with ragged edges. Testicles enlarged and evidently attached to the

scrotal walls. The spermatic cords thickened and soft to the feel. Sheath and scrotum thickened and fibrous. Purchased and killed by shooting through the brain.

The post-mortem examination showed the lymphatic glands more or less thickened; testicles enlarged one-third, and show, near points of adhesion on convex surface, small irregular ulcerated spots. Scrotum contained about 2 quarts of straw-colored serum. Spermatic cords and arteries very much enlarged, the cord being as large as a man's wrist.

Case 3.—Gray mare, 4 years old, property of Andrew Larsen. This mare, in May of last year, got away and got with Beckwith's stallion (case 2). For a month afterwards she swelled very badly about the vulva. The swelling then subsided and she seemed very weak, staggering as she walked, and emaciated and unthrifty in appearance. She has been so weak and unthrifty as to be unable to work. At present is thin in flesh. Appetite good; cut food does not seem to do her any good. Vulva swollen and covered with white confluent spots. Clitoris white and rigid. No discharge from vagina. Purchased and killed. Both ovaries greatly enlarged, about 4 inches each in diameter, and appear as blood clots more or less organized contained in fibrous capsules.

Case 4.—Bay mare described in my report of last year as the McSparran mare. This mare was bred to the Swigert horse two years ago and has shown evidence of disease since, although she has done work regularly. Shortly after having been bred she showed a glairy discharge from vulva and white spots began to show over vulva and anus. She lost flesh, but did not get so weak as to stop her work. The mare seemed to improve in condition this spring, and was much stronger when I saw her than when seen last year. The white spots had most of them left the vulva, and she showed no discharge. The mucous membrane of the vagina was a pale pinkish white and the clitoris had completely lost its color. At times the mare is very weak across the loins and shows almost a staggering gait; at other times seems strong. This spring the mare was bred to a small bay stallion, the property of Joel Crow, who lives 6 miles east of Lavaca, Nebr. Shortly after having been bred she began to fail, and at the time of purchase and slaughter was unable to stand her work.

We purchased and killed her, and post-mortem revealed that the left ovary was normal, the right about the size of a man's fist, and contained a partly organized blood clot. Clitoris white and rigid; lymphatics enlarged; other organs normal. The Crow stallion bred to this mare has been killed.

Case 5.—Gray mare, 6 years old, property of Batiste Pourrier, Manderson, S. Dak. Pourrier purchased from Waller Brothers, Charles City, Iowa, a black draft stallion in the spring of 1892. This horse seemed sick for some time, but was supposed to be suffering from the effects of having been shipped. He seemed to be as amorous as usual, but had difficulty in covering his mares. He was put with a bunch of 17 mares, which he served at various times during the summer. Of the 17, all but 4 died. This mare was one of those served. She showed confluent white spots over vulva and anus and the underside of tail, and extending down the thighs and over the udder; also similar spots around the nose and eyes. Purchased and killed her by shooting.

The post-mortem showed the lymphatic glands indurated and enlarged, those of the mesentery ranging in size from a hazelnut to an English walnut. Numerous petechial spots over the mesentery. The organs in the abdominal cavity and thorax normal, the walls of the uterus thickened and indurated. Mucous membranes thickened and covered with a yellowish gelatinous deposit. The left ovary was the size of a man's fist, and contained in its center and extending from side to side a partially organized blood clot; right ovary normal. Clitoris a pale pink and surrounded by a cheesy deposit.

Case 6.—Gray mare, 7 years old, property of Pourrier. This mare was bred to the Waller horse in spring of 1892 and to a stallion on the place about six weeks ago. This animal was very fat and showed no evidence of disease except a pinkish white clitoris and a peculiar gait behind. Purchased and killed by shooting. The uterus contained a fetus about six weeks old. Right ovary about the size of a man's fist, and showing a center of coagulated blood about the size of an English walnut and numerous cavities containing a straw-colored serum. Left ovary the size of a child's head, hard to the feel and glistening in appearance. On section about one-half pint of bloody serum escaped, leaving a fibrous yellowish clot weighing about 2 pounds. The whole character of the ovary was changed.

The above cases amply illustrate the character of the disease we have been combating. From them it will readily be seen that while it is a comparatively easy matter to diagnose the disease in its acute form, those cases which have apparently recovered, or which may more properly be termed chronic, present greater difficulties.

VARIATION IN PERIOD OF INCUBATION.

Taking the service book of the stallions known to have been diseased, and counting from the date of the service to the date when the mares were first noticed to have been diseased, we find a great variation in the period of incubation. Some of the mares were very apparently sick inside of two weeks and were dead in less than two months, while from all accounts some of them did not show evidence of disease for four or five months, and in some cases the owner claims even longer than that. I think it is safe to say that the period of incubation varies within those limits, i. e., from two weeks to four months. The symptoms as I have detailed them in my report of last year and at this time vary somewhat from those described by most writers on maladie du coït, but I do not think the variations are greater than could be expected when we take into consideration differences in climatic conditions and methods of handling.

Mares kept running at large summer and winter upon the open range in the high altitude and dry climate of the Nebraska and Dakota plains are in much better condition to resist the ravages of disease than those kept under confinement in a lower and more dense atmosphere.

While here numerous rumors, more or less specific in character, have reached us of the presence of this disease in the neighborhood of Casper, Wyo. In order to investigate the trouble there, on the 16th of August we drove over the range from Casper to the ranch of Hon. B. B. Brooks, 20 miles southeast of Casper. During the last three years Mr. Brooks reports that he has lost about 50 per cent of all his horses from some disease, and that this experience has been repeated by all the ranchmen in his part of Wyoming. The symptoms as seen in several cases are those of spinal meningitis. Mr. Brooks is of opinion that the trouble arose from a horse brought into the country from the East and turned loose upon the range, and that before this horse was brought there no cases had ever been known.

The Hon. Mr. Hurt, State senator of Wyoming, is fully convinced that the disease is due to a vegetable poison of some kind, and points to the habits of Indians years ago of driving their horses off from this range in the fall and spring because they were "heap sick," and that as soon as moved the trouble stopped. Mr. Brooks, on the other hand, claims that he has often moved his horses without good results.

The trouble is evidently epizootic spinal meningitis. We could find no trace of maladie du coït in Wyoming.

We found several cases of maladie du coït upon the Indian Reservation. Through the kindness of Capt. Charles G. Penny, acting Indian agent at Pine Ridge, S. Dak., we were enabled to make a careful inspection of the principal herds of horses on the reservation. Most of them are found along the White River and its southern tributaries. We found several cases of the disease on the ranch of Batiste Pourrier on Wounded Knee Creek, evidently contracted from the horse described above as having come from Waller Brothers, in Iowa.

We found one case at the ranch of N. Janis, on White River, and one in the herd of Louis Shangrau. These mares could have been easily infected by a stallion on Pourrier's stud, which ran fora time on the range.

One case on Medicine Root Creek belonging to J. O'Rourke was evidently infected in the same manner. We inspected about 2,000 horses on the reservation and found no disease outside of this one infection.

It is quite impossible to determine the extent of the exposures that there may have been upon the range. But from the habit of horses running at large in distinct bands, each stallion staying with his own harem and not allowing other horses to mix with them, we do not think that the danger of infection is great. We have found but few stallions affected. Most of the owners of stallions in the vicinity of Gordon, Nebr., have refused to breed to mares for the past two years that were not known to be sound, and most of those horses that had been exposed have been either castrated or have died.

We castrated several stallions that had probably been exposed, and in most cases the castrated horses have greatly improved in flesh and strength after castration. Several of the stallions that were castrated at our suggestion last year are fully recovered and at work.

One section of the country that should be carefully watched is the range country south of Gordon, in what is known as the Sand Hills. The Beckwith horse, noted above, ran in that part of the country for some time and may have served mares which we have not been able to find. It is impossible to find all of them. Several cases have been reported upon ranches at the head of Pine Creek, in Sheridan County, 50 miles southwest of Gordon. I visited the range there and inspected the herds of L. H. Hooper, H. Green, J. Hawkins, and Christ. Mosler. I found that several mares belonging to these parties had been caught in a prairie fire and rather severely scorched over the udders, peritoneum, and vulva, resulting in swelling and ulceration. These mares have, so far as I could find, recovered, and I could find no evidence of maladie du coït.

This range is about 60 miles west of the one where the Beckwith horse ran. With a possible danger in the locality indicated, we believe the disease to be completely eradicated.

PREVALENCE OF TUBERCULOSIS AMONG CATTLE IN NEW YORK.

WASHINGTON, D. C., *June 15, 1893.*

SIR: Your authorization, dated March 20, 1893, directing me to go to Charlotte and Rochester, N. Y., and such other places in that vicinity as would be necessary to investigate an outbreak of tuberculosis among cattle, gives me the opportunity to make the following report.

Very respectfully,

E. C. SCHROEDER, M. D. V.,
Veterinary Inspector.

Hon. J. STERLING MORTON,
Secretary of Agriculture.

About the beginning of February, 1893, a cow belonging to a herd of registered Jerseys near Charlotte, N. Y., died from an affection diagnosed on post-mortem examination as tuberculosis. This circumstance, together with the owner's belief in the contagious nature of the disease, led him to suspect the presence of other cases in his herd, and to the determination to remove them if possible. A Rochester veterinarian was consulted, and on February 24 and 25 the entire herd was inoculated with Koch tuberculin—one-half the herd on the first date and the remainder on the second. Subsequently 1 bull, 8 cows, and 1 heifer were destroyed, and all found to be tuberculous upon post-mortem examination.

At this stage the work ended. Other animals also seemed to have shown the reaction after inoculation, indicating tuberculosis, but in a degree too small to warrant their destruction. The temperature of the cattle had been taken only a single time previous to inoculation, and the absence of a series of temperatures taken before inoculation left the operator without a criterion of the value of such slight elevations as may have occurred after the inoculation of what evidently was a dose of tuberculin too small to cause really significant reactions.

I saw the herd the first time on March 24. At that time it consisted of 26 animals in excellent condition, well fed, well stabled, and generally well cared for.

On March 25 the temperature of each animal was taken per rectum every two hours, from 10.25 a. m. to 10.25 p. m., and at midnight each animal received a dose of tuberculin in a 12½ per cent solution injected under the skin on the left side of the neck. The tuberculin used was prepared in the chemical laboratory of the Bureau of Animal Industry.

On March 26 the temperatures of the animals were again taken every two hours from 8.25 a. m. to 10.25 p. m. During the two days the herd was under observation it was cared for in as nearly as possible the customary manner. It was watered once daily, about noon; fed three times, receiving ensilaged cornstalks, bran, corn meal, and hay, and milked twice, morning and evening.

The history of the trouble in this herd is merely the presence of a mildly contagious, slowly fatal affection, of which the recognizable symptoms do not become evident until the disease is far advanced

among a number of cattle, several or all of which trace their ancestry more or less directly back to a tuberculous mother herd.

RESULTS OF INOCULATIONS.

The results of the inoculations, as determined by the rise in temperature and the post-mortem examinations of the animals destroyed, are given as follows:

Cow No. 1.—Condition good; age, 7 years; calved about three months ago; had not been served by bull since. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	99.4	101.0	100.6	101.4	101.0	101.6	101.6
March 26.—Temperature (degrees F.) after inoculation	102.5	103.2	105.8	104.8	102.4	103.2	104.6	102.2

The rise of temperature on March 26, indicating the presence of tuberculosis, led to the destruction of the animal April 3. Post-mortem examination showed, in the left principal lobe, where it rests against the right principal, halfway between the cephalic and caudal ends, a tuberculous mass as large as a man's fist. A similar mass, half as large, in the same region of the right principal lobe, was found. There was a third tuberculous mass, 1½ inches in diameter, in the center of the right ventral lobe. Mediastinal, bronchial, portal, and mesenteric glands containing cheesy tubercles were discovered.

Cow No. 2.—Condition good; age, 3 years; had been served by bull about six months before, and was pregnant. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	102.0	102.1	101.6	102.1	101.8	102.0	102.0
March 26.—Temperature (degrees F.) after inoculation	105.0	105.8	107.5	106.4	106.0	106.0	105.2	104.5

Killed March 31 and examined post-mortem.

In the left ventral lobe, at its root, there was found a tuberculous mass 2 inches square, visible on the surface and dipping into the lung tissue to the depth of its diameter. The mediastinal glands were enlarged and caseous throughout. There were a few small caseous tubercles in the mesenteric glands.

Heifer No. 3.—Condition good; 3 years old; served for the first time six months ago; pregnant. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p m	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	102.1	101.7	101.6	102.1	102.2	102.0	101.8
March 26.—Temperature (degrees F.) after inoculation	108.2	107.0	106.5	106 3	105.2	105.2	104.5	103.5

Killed March 31 and examined by post-mortem.

The only tubercular lesion found was one mediastinal gland enlarged to 5 inches long, 2 inches thick, and 1 inch wide, and entirely converted into a cheesy mass sprinkled with calcareous particles.

The liver contained on surface and section a number of small necrotic areas one-sixteenth of an inch in diameter and clusters of such areas one-third to one-half of an inch in diameter, probably of parasitic origin.

Cow No. 4.—Condition good; 3½ years old; seven months pregnant. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.8	101.6	101.4	101.8	102.2	102.0	101.8
March 26.—Temperature (degrees F.) after inoculation	102.5	102.2	102.0	101.8	101.8	101.7	101.8	102.2

This cow aborted March 26, 6 a. m., about six hours after inoculation. Whether the inoculation was to blame for this remains an unanswered question, excepting that it is well to bear in mind, in this connection, that it is by no means the first case of abortion which had occurred in the herd.

The rise in temperature after inoculation was not sufficient to condemn the cow as tuberculous, and even had there been a marked elevation it would hardly have been just under the circumstances to attribute it to the presence of tuberculosis.

Cow No. 5.—Condition good; calved several months ago, and had not been served by bull since. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	102.0	101.8	102.4	102.2	102.0	102.4	102.0
March 26.—Temperature (degrees F.) after inoculation	101.3	101.4	101.5	101.6	102.0	101.6	101.2	101.5

No reaction. Animal not killed.

Cow No. 6.—Condition fair; 10 years old; calved four months ago, and has not been served by bull since. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	100.7	101.4	101.2	102.0	101.5	101.4	101.0
March 26.—Temperature (degrees F.) after inoculation	102.5	104.6	105.8	105.4	105.0	105.0	106.0	104.0

Killed March 30 and examined by post-mortem. In the center of the left principal lobe was found a tubercular area 1½ inches in diameter. A few small cheesy tubercles were also found in the mediastinal and mesenteric glands. On the omentum were a number of small pink tubercles. Liver as in case No. 3

Cow No. 7.—Condition good; calved about two months ago, and has not since been served by bull. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.4	101.4	101.8	101.8	101.8	101.4	101.6
March 26.—Temperature (degrees F.) after inoculation	104.9	105.0	106.9	106.4	105.6	105.8	106.4	105.4

Killed March 30 and examined by post-mortem. One gland in the posterior mediastinum contained some tubercles from one-fourth to one-half of an inch in diameter; the substance of these tubercles was cheesy, with calcareous particles. Numerous small cheesy tubercles in the mesenteric glands were found. Liver as in case No. 3.

Cow No. 8.—Condition good; age, 3 years; aborted November, 1892, in the sixth month of pregnancy, and has not since been served by bull. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	100.9	101.6	101.6	102.0	101.5	101.5	102.2
March 26.—Temperature (degrees F.) after inoculation	102.2	101.2	101.6	101.5	102.2	101.5	102.6	102.2

The slight elevation in temperature the day following inoculation was not considered sufficient to justify destroying the animal.

Heifer No. 9.—Condition fair; age, 3 years; very small for age; had been served for first time by bull about two months ago; some doubt as to pregnancy. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.8	101.8	101.4	101.8	101.9	101.4	101.2
March 26.—Temperature (degrees F.) after inoculation	102.5	101.8	101.9	101.4	102.0	102.0	102.0	102.0

No reaction; not killed.

Heifer No. 10.—Condition good; 1 year old; has not been served by bull. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	102.3	101.8	101.8	102.2	102.0	102.3	102.4
March 26.—Temperature (degrees F.) after inoculation	105.5	106.2	106.2	106.2	105.6	105.8	104.2	105.6

Killed March 30 and examined by post-mortem. Two tubercular areas in the left principal lobe, near the center of the lobe, one 4 inches and the other 1 inch in diameter. There was adhesion between the larger area and the chest wall. One gland in the posterior mediastinum, 3 inches by 1½ inches by 1 inch in size, was found to contain six cheesy tubercles.

Cow No. 11.—Condition good; 3½ years old; seven months pregnant. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.7	101.8	102.6	102.0	102.0	102.2	102.2
March 26.—Temperature (degrees F.) after inoculation	103.7	104.9	105.7	106.5	105.4	105.0	105.0	102.6

This animal, notwithstanding the fact that she gave the reaction characteristic of tuberculosis in a high degree, was not destroyed. She was spared for the time being in order to save her calf.

Cow No. 12.—Condition good; about 3 years old; seven months pregnant. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.8	101.8	101.8	101.8	102.3	102.2	102.2
March 26.—Temperature (degrees F.) after inoculation	106.6	107.4	107.0	107.0	106.8	105.8	106.6	105.2

This animal was not killed for the same reason given for sparing cow No. 11.

Heifer No. 13.—Condition good; 2 years old; had been served by bull about two months ago. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.8	102.0	101.7	102.0	102.1	102.2	102.8
March 26.—Temperature (degrees F.) after inoculation	103.3	104.6	105.9	106.3	105.8	105.4	106.0	105.8

Killed April 3 and examined by post-mortem. In the left principal lobe, near its caudal end, embedded in the lung substance, was a tubercular nodule 1 inch in diameter. A few small, cheesy tubercles in the mesenteric lymphatics were found. Liver as in case No. 3, excepting that the lesions were more extensive.

Heifer No. 14.—Condition good; about 3 years old; served by bull two months ago. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.5	101.4	101.7	101.8	101.8	101.9	102.0
March 26.—Temperature (degrees F.) after inoculation	102.2	102.2	101.8	101.5	101.3	101.6	101.4	101.5

This heifer gave no reaction from which tuberculosis could be diagnosed, but as the man in charge of the herd suspected that she was affected, and both her parents had shown tuberculosis on post-mortem examination, she was destroyed. On post mortem, April 3, one mediastinal gland was found enlarged to 2 inches in length, 1 inch thick, and 1 inch wide, and contained four caseous tubercular areas, each one-half of 1 inch in diameter. Mesenteric glands contained several cheesy tubercles. Liver as in case No. 3.

Heifer No. 15.—Condition good; 2 years old; had never been served by bull. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.2	101.6	101.6	102.0	102.3	101.8	101.9
March 26.—Temperature (degrees F.) after inoculation	102.5	102.3	103.3	100.2	101.6	102.0	101.6	101.5

The reaction, if the slight increase in temperature the day following inoculation can be called such, was not considered sufficient to justify killing the animal.

Heifer No. 16.—Condition good; 1 year and 3 months old; had never been served by bull. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.6	102.1	101.8	101.9	101.9	101.8	101.9
March 26.—Temperature (degrees F.) after inoculation	104.5	105.7	105.6	106.4	105.8	105.3	104.8	104.5

Killed March 31 and examined by post-mortem. Nothing found but a few caseous tubercles in the mesenteric lymphatic glands.

Heifer No. 17.—Condition good; 1 year old. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.0	101.8	101.7	102.3	102.1	102.0	101.8
March 26.—Temperature (degrees F.) after inoculation	101.6	101.8	101.6	102.2	101.8	102.2	101.8	101.4

No reaction; not killed.

Heifer No. 18.—Condition good; 1 year old. Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.8	102.0	101.4	102.3	102.3	101.6	102.4
March 26.—Temperature (degrees F.) after inoculation	104.5	104.6	106.0	105.8	105.7	106.2	105.4	104.8

Killed April 4 and examined by post-mortem. The intestinal lymphatics contained a number of tubercles with cheesy centers. Liver as in case No. 3.

Heifer No. 19.—Not quite 1 year old; condition good Received 1½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2 25 p m	4 25 p m	6 25 p m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101. 6	101. 6	101. 5	102. 0	101. 6	101. 8	101. 6
March 26.—Temperature (degrees F.) after inoculation	102. 6	101. 8	101. 4	101. 8	102. 8	102. 0	102. 0	101. 4

Not killed.

Calf No. 20.—Male, 4 months old; condition good. Received 1 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	102. 8	102. 4	101. 8	102. 4	102. 5	102. 4	102. 7
March 26.—Temperature (degrees F.) after inoculation	102. 0	101. 4	101. 6	101. 8	101. 8	103. 6	102. 0	102. 2

No reaction; not killed.

Calf No. 21.—Female, 1 month old; condition good. Received ¾ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101. 6	102. 0	102. 0	102. 7	103. 0	102. 6	102. 7
March 26.—Temperature (degrees F.) after inoculation	102. 0	102. 5	103. 2	102. 2	102. 6	102. 5	101. 9	103. 6

No reaction; not killed.

Calf No. 22.—Female, 1 week old; condition good. Received ½ c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	103. 0	103. 4	102. 6	103. 3	104. 2	104. 0	103. 0
March 26.—Temperature (degrees F.) after inoculation	103. 0	102. 0	101. 1	101. 8	102. 0	102. 4	102. 5	102. 4

No reaction; not killed.

Bull No. 23.—Condition good; 3 years old. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	12.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	100. 6	101. 4	100. 0	100. 6	100. 8	101. 8	101. 0
March 26.—Temperature (degrees F.) after inoculation	105. 0	105. 6	106. 2	105. 4	106. 2	106. 6	105. 6	104. 2

Killed April 3 and examined by post-mortem. In the center of the left ventral lobe was found one tubercular area embedded in the lung tissue about 1 inch in diameter. There was a similar area in the anterior portion of the left principal lobe where it rests against the left ventral. There were two similar areas in the center of the left principal lobe. These tubercular areas were all embedded within the lung tissue and were invisible until an incision was made. The mediastinal and bronchial glands were all enlarged, and many either contained cheesy foci or were cheesy throughout. The mesenteric glands and the glands at the portal fissure contained cheesy tubercles.

Bull No. 24.—Condition good; 2 years old. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.2	101.6	102.3	102.3	102.5	102.3	102.5
March 26.—Temperature (degrees F.) after inoculation	102.0	102.2	101.3	101.4	102.4	101.8	102.5	101.0

No reaction; not killed.

Bull No. 25.—Condition good; 6 years old. Received 2 c. c. tuberculin solution.

	Hour at which temperature was taken.							
	8.25 a. m.	10.25 a. m.	12.25 p. m.	2.25 p. m.	4.25 p. m.	6.25 p. m.	8.25 p. m.	10.25 p. m.
March 25.—Temperature (degrees F.) before inoculation	.....	101.2	101.9	102.5	101.7	102.2	101.2	101.3
March 26.—Temperature (degrees F.) after inoculation	102.5	103.3	104.7	105.2	103.8	103.4	102.5	101.0

Killed March 31 and examined by post-mortem. Almost one-half of both principal lobes was converted into tubercular cheesy matter, the posterior half of the lobes being affected. Scattered throughout the entire lungs were tubercular foci from one-fourth of an inch to 2½ inches in diameter. All the glands about the lungs, mediastinal, bronchial, etc., were enlarged and either sprinkled with tubercular foci or entirely converted into caseous matter. A few small tubercules were found in the mesenteric glands.

Cow No. 26.—Condition good; age, 3 years; calved March 30. This cow was not inoculated on March 25 with the balance of the herd. She showed marked symptoms of calving in a few days, and it was believed best to wait until that event had taken place. Inoculated April 3 at 12 p. m., receiving 2 c. c. of the tuberculin solution.

	Hour at which temperature was taken.							
	8.00 a. m.	10.00 a. m.	12.00 m.	2.00 p. m.	4.00 p. m.	6.00 p. m.	8.00 p. m.	10.00 p. m.
April 3.—Temperature (degrees F.) before inoculation	101.4	101.6	101.0	101.4	101.8	102.2	102.0	102.4
April 4.—Temperature (degrees F.) after inoculation	104.8	105.8	105.2	.....	.....	.....	.....	.....

Killed April 4, 1 p. m., and examined by post-mortem. In the right principal lobe, visible on the ventral surface, there was found a tubercular area about the size of a hen's egg, and in the center of the right ventral lobe an area about one-fourth of an inch in diameter. There were no other lesions.

A second herd of registered Jerseys, which had substantially the same history as the foregoing, was inoculated at Newport, N. Y. It consisted of one bull, three cows, and four heifers, constituting the remainder of a herd which had been under the care of the same Rochester veterinarian already spoken of in connection with the first herd. Here likewise a number of animals had been destroyed and found to be tuberculous, and here again the work ended prematurely for the same reason already advanced in connection with the first herd. The results of the inoculations and post-mortem examinations I conducted are given below:

Cow No. 1.—Condition fair; 4 years old; pregnant about seven months. Inoculated March 28, 10 p. m., receiving 2 c. c. of tuberculin solution.

[The long interval in taking the temperature March 28, from 11 a. m. to 4 p. m., was due to the accidental breaking of the clinical thermometer in use and the time required to secure a new one. The same is true of the other cases where a longer interval than two hours occurs between any two recorded temperatures.]

	Hour at which temperature was taken.									
	5.00 a. m.	7.00 a. m.	9.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m.	5.00 p. m.	7.00 p. m.	9.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	102.6	103.0	102.0	101.0	.....	.....	101.4	101.4	101.2	100.4
March 29.—Temperature (degrees F.) after inoculation	100.2	100.8	102.0	102.6	103.0	103.2	.....	103.2	103.2	103.8

Killed April 1 and examined by post-mortem. A few small nodules with cheesy contents were found in the mesenteric lymphatic glands after long searching. It is possible that the nodules found in this animal were of parasitic origin, as it is also possible that the slightly elevated state of the temperature after inoculation was not due to the action of the tuberculin. The difference between the highest temperature registered before and after inoculation is only eight-tenths of one degree, and this elevation did not occur until twenty-three hours after inoculation. The only important point is the continued slight elevation from the thirteenth until the twenty-third hour after inoculation, but as this may be accounted for on other grounds than the action from the tuberculin in an animal seven months advanced in pregnancy, I would suggest that this case be thrown out, as having no true value in one direction or the other.

Cow No. 2.—Condition fair; 4 years old; pregnant. Inoculated at the same time and given the same dose as Cow No. 1.

	Hour at which temperature was taken.									
	5.00 a. m.	7.00 a. m.	9.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m.	5.00 p. m.	7.00 p. m.	9.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	101.4	101.2	101.0	100.4	.....	.....	100.6	101.2	101.4	102.0
March 29.—Temperature (degrees F.) after inoculation	102.0	100.6	101.6	101.2	100.8	101.4	.....	101.8	102.8	102.2

No reaction; not killed.

Heifer No. 3.—Condition good; age, 2 years. Received 1½ c.c. tuberculin solution March 28, 10 p. m.

	Hour at which temperature was taken.									
	5.00 a. m.	7.00 a. m.	9.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m.	5.00 p. m.	7.00 p. m.	9.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	102.4	102.6	102.0	101.8	.....	.....	101.8	101.4	101.2	101.4
March 29.—Temperature (degrees F.) after inoculation	102.4	101.4	100.6	100.8	101.8	102.0	.....	101.6	102.6	102.2

No reaction; not killed.

Cow No. 4.—Condition poor; 8 years old; supposed to be pregnant; very nearly full time; had the appearance of a cow in that condition. Received 2 c. c. tuberculin solution 10 p. m., March 28.

	Hour at which temperature was taken.									
	5.00 a. m.	7.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m.	5.00 p. m.	7.00 p. m.	9.00 p. m.	11.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	102.2	102.5	102.0	101.4	.....	.....	101.4	101.4	101.0	101.8
March 29.—Temperature (degrees F.) after inoculation	101.4	101.0	101.6	101.8	101.6	101.2	.....	101.2	102.0	100.4

Notwithstanding the absence of a reaction, this animal was destroyed and examined by post-mortem April 1. The lung was found to be exceedingly large, and collapsed little or not at all when the thorax was opened; every part of it was emphysematous, and upon section each lobule was marked in its center by an irregular black patch 1 mm. in diameter, surrounded by a yellowish green area 1 mm. broad. There were several adhesions between the chest wall and the lung on both sides by means of firm connective-tissue bands. Similar adhesions to the diaphragm, and the various lobes of the lung bound to each other by similar connective tissue. The glands in the posterior mediastinum enlarged and sprinkled with cheesy areas from one-half to two-thirds of an inch in diameter. A few cheesy tubercles found in the mesenteric glands. The left ovary was enlarged to the size of a man's fist, and the right ovary was one-half as large. The increase in size upon section appeared to be due to an extensive increase in the connective tissue.

The cow had been running with the bull during the three months previous to the last six or seven before slaughter, and had so much the appearance of pregnancy that both the local veterinarian and the man in charge believed her heavy with calf. On post-mortem no sign of pregnancy was visible.

Heifer No. 5.—Condition good; 3 years old; pregnant. Received 2 c. c. tuberculin solution 10 p. m., March 28.

	Hour at which temperature was taken.									
	5.00 a. m.	7.00 a. m.	9.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m.	5.00 p. m.	7.00 p. m.	9.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	103.4	104.2	102.2	102.2	.....	.....	102.4	102.6	102.4	103.2
March 29.—Temperature (degrees F.) after inoculation	102.8	102.6	103.8	103.6	103.2	103.2	.....	103.8	103.8	103.0

The temperature of this animal was so irregular the day before inoculation that nothing could be determined from the slight, apparently constant elevation following the inoculation. Physical examination showed the presence of a heart trouble. Not killed because she was an animal of particular value.

Heifer No. 6.—Condition good; 2 years old. Received 1½ c. c. tuberculin solution 10 p. m., March 28.

	Hour at which temperature was taken									
	5.00 a. m.	7.00 a. m.	9.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m.	5.00 p. m.	7.00 p. m.	9.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	101.2	101.4	101.0	100.6	.....	.....	101.4	101.6	101.0	101.0
March 29.—Temperature (degrees F.) after inoculation	101.6	101.6	101.8	102.0	101.2	102.2	.....	101.6	101.6	101.2

No reaction; not killed.

Heifer No. 7.—Condition good; 2 years old. Received 1½ c. c. tuberculin solution 10 p. m., March 28.

	Hour at which temperature was taken.									
	5.00 a. m.	7.00 a. m.	9.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m.	5.00 p. m.	7.00 p. m.	9.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	101.2	101.4	101.0	.....	.....	.....	101.6	102.4	102.2	102.0
March 29.—Temperature (degrees F.) after inoculation	100.4	101.8	101.8	101.6	100.8	102.0	.....	102.4	102.6	102.4

No reaction; not killed.

Bull No. 8.—Condition good; age 3 years. Received 2 c. c. tuberculin solution 10 p. m., March 28.

	Hour at which temperature was taken.									
	5.00 a. m.	7.00 a. m.	9.00 a. m.	11.00 a. m.	1.00 p. m.	3.00 p. m.	4.00 p. m	5.00 p. m.	7.00 p. m.	9.00 p. m.
March 28.—Temperature (degrees F.) before inoculation	101.4	101.0	101.6	.....	.....	.....	101.6	101.4	101.2	100.6
March 29.—Temperature (degrees F.) after inoculation	100.4	101.6	103.6	103.4	102.0	103.6	.....	102.2	102.2	102.0

Killed April 1 and examined by post-mortem. The central portion of the left principal lobe was found adherent to the chest wall by means of pale pink bands of tissue; under this adhesion in the lung tissue were two cheesy foci, each about 2 inches in diameter. One of the posterior mediastinal glands was enlarged and contained two cheesy tubercles.

REVIEW OF THE WORK.

A general review of this work shows a reaction in 15 animals out of a total of 34 inoculated with tuberculin. Of the 15 animals which reacted 13 were destroyed and examined by post-mortem, and in each of them it was possible to clearly determine the presence of tubercular lesions, sufficiently extensive in only two or three cases for a possible ante-mortem diagnosis. In addition to this, 1 animal was destroyed in which the reaction was doubtful, and here, also, the lesions were of a doubtful

character, and 2 animals were killed which gave no reaction but had the history and general appearance indicative of tuberculosis, and in these, also, lesions of tuberculosis were found. This would lead to the conclusion, if the present experiment is taken by itself, that the presence of a reaction is coincident with the presence of tuberculosis, but that for some unaccountable reason the absence of a reaction by no means signifies that the animal is not affected. Why the inoculation should have given negative results in the presence of tuberculosis in heifer No. 14 of the first, and cow No. 4 of the second herd is a difficult question to answer. The probability is that a reaction may have been present in heifer No. 14 previous to the taking of the first temperature, March 26; at least this view seems plausible when taken into consideration with the fact that the first temperature, taken March 26, eight and one-half hours after inoculation, was slightly higher than any temperature the day preceding inoculation, and that this slight elevation was still present two hours later in the day. A second inoculation with tuberculin, about two weeks after the first, would have been desirable in this case, as well as several other cases which showed a like minute rise in temperature the day after inoculation. In cow No. 4 of the second herd the extensive affection of the lungs and ovaries may have acted a part in suppressing the reaction; consequently I believe these cases should have little weight in estimating the degree to which reliance can be placed upon the results of tuberculin inoculation for practical purposes.

INJURIES TO CATTLE FROM SWALLOWING POINTED OBJECTS.

By THEOBALD SMITH, M. D., and CHARLES F. DAWSON, M. D., D. V. S.

That cattle are very prone to swallow indigestible substances, many of them injurious and even fatal, has been known to veterinarians for a long time. It is, however, regarded by many of them of rare occurrence, a casualty worthy of note more as a curiosity than as something demanding constant attention.

Autopsies on tuberculous cattle made during the past four years have shown clearly that injuries inflicted by pointed metallic bodies are of frequent occurrence, and therefore of decided economic importance.

Information gained from the above-mentioned examinations causes us to believe that this evil may, to some extent, be prevented. It was noticed that while in certain herds nearly all animals examined were free from injuries due to foreign bodies, in others nearly every one was injured. On investigation it was ascertained that this difference was due to the fact that one herd had access to miscellaneous objects on pastures and the other had not. Before giving any illustrations of these statements, let us see what injuries are caused by foreign bodies.

Among the most frequent post-mortem indications of the presence of some foreign body are evidences of an inflammatory process about the second stomach (reticulum, or honeycomb) by which it becomes fastened, either to the liver or to the diaphragm, or to both. In the new tissue formed by this inflammatory process are one or more round abscesses or tumors, which when cut open discharge a foul-smelling pus. In some of the herds examined scarcely an animal was free from this inflammatory condition. The binding down of the free (ventral) end of the liver by inflammation is equally frequent and accompanied by a degeneration of some of the liver tissue. Again, the course of the foreign body is invariably toward the lungs and the heart. It punctures the liver or the diaphragm and penetrates a lobe of the lungs or the heart. When it enters the lungs a pneumonia is usually started which extends over the greater part of the affected lobes. In some instances an abscess forms, and this may break into an air tube and the contents be discharged externally.

The most unfortunate and usually fatal injury is the penetration of the heart by the pointed body. Death may come speedily or slowly after a wasting disease, according to the nature of the injury to the heart. In the cases which we have seen, the injury usually resulted in an inflammation of the pericardial sac, followed by suppuration. The pericardium becomes enormously distended with fluid and pus. This exudate compresses the heart to such an extent that its action becomes very feeble and death results from general dropsy.

Another disease which has been lately observed by us in dairy cattle, as a result of injury to the second stomach by foreign bodies, is

abscess in the liver. Sometimes there were as many as five or six of these abscesses, each at least as large as a hen's egg and filled with foul pus.

The literature on this subject is meager, most authors dismissing it with a few sentences. Thus Chauveau says:

It may be noted that the foreign bodies so frequently swallowed by ruminants are usually lodged in the reticulum (second stomach). Therefore it is that at the bottom of the cells are found either small stones and needles or pins, often fixed in the intermediate septa, or nails, scraps of iron, etc.

Most writers deal only with the graver kinds of disease due to foreign bodies, such as those which affect the heart, because only fatal cases have come to their notice. Williams says:

In ruminants, particularly cattle, foreign bodies often find their way into the pericardium (heart case), wounding both it and the heart. While the carditis (inflammation of the heart) so induced is circumscribed and merely surrounds the point of puncture, the pericardial inflammation and exudation involve the whole surfaces of the membrane. Cattle are exceedingly fond of chewing and swallowing all sorts of substances. For example, nothing seems to give greater pleasure to a cow than to have an old boot or other piece of leather in its mouth, and this it will chew at with evident gratification. An old brush is also a dainty morsel, and I have seen as a consequence of this that the pericardium has been pricked by the brush nail. Many kinds of sharp-pointed materials have been found in the pericardium of cows. I have seen hairpins, horsenails, needles. Some writers suppose that needles frequently pass from the esophagus to the heart. Such an occurrence is quite possible, but my own experience, and that of other veterinarians in this country, points to the conclusion that the foreign body finds its way to the heart from the second stomach (reticulum), first of all piercing the wall of that viscus (organ) and the diaphragm, and being gradually drawn by the suction action of the heart into the pericardial sac, generally wounding some portion, commonly the apex of the heart itself. At present I need only state that in cases where a foreign body has been found inducing pericarditis (inflammation around the heart) its course from the second stomach through the diaphragm and mediastinum into the pericardium can be demonstrated post-mortem by the presence of a canal or opening, surrounded by walls of lymph, extending from the stomach to the heart, the foreign body itself lying in the canal, generally more or less eroded or worm-eaten by the action of the juices by which it is surrounded. Sometimes, however, the foreign body, particularly if a substance, such as a needle, which soon rusts, is worn down to a mere fragment, or, in some instances, has entirely disappeared by chemical decomposition. In other instances it has been found in the cavities of the heart itself.

Steel, in his Diseases of the Ox, mentions traumatic heart disease as a rather frequent occurrence. He finds hairpins, knitting needles, and nails as a cause. Gamgee described as the cause of a fatal case of traumatic heart disease a "pomegranate prickle" a little over an inch long and as thick as a writing quill which after death was found lodged in one of the cavities of the heart.

Although cattle swallow a great variety of objects, it is the pointed, slender, metallic ones, such as pieces of wire, hairpins, etc., which do most harm.[1]

M. Boizy states that the presence of a foreign body when it is the cause of pericarditis may be diagnosed with great certainty. Certain symptoms are common to both simple and traumatic pericarditis, the

[1] It is a common practice among the maw cleaners at the stock yards in Chicago to collect as curiosities all foreign bodies which are found in the stomachs. Mr. J. B. Sine, an employee of the Bureau of Animal Industry at Chicago, made a collection of articles which were said to have been taken from the stomachs of cattle slaughtered for beef, and loaned them to the Bureau as an exhibit for the Columbian Exposition. The following is a partial list of the articles exhibited: A large jackknife, a silver watch chain, a silver dollar, several smaller coins, numerous metal hairpins, buttons, suspender buckles, Masonic emblem, several pieces of scrap iron, some flat and others round and bent, several very large nails and many of the smaller sizes.

latter being the form usually caused by foreign bodies. In both forms the pulse is feeble. There is venous pulsation, and œdema (dropsy) of the dewlap.

The only certain differential symptoms are the peculiar character of the heart sounds and the eructation of gas.

In the simple form the gurgling sound is heard with extreme difficulty.

In the traumatic form it is easily heard, and has a rushing, gurgling character, resembling the sound produced by the plunging of butter in a churn. If the noise be feeble increased exercise will increase it, making it plainly audible.

Simple pericarditis is comparatively rare. In it there is no marked eructation of gas.

To show the differences in the post-mortem appearances in herds which are on pastures favorable to the production of the injuries under discussion and those herds which are not subjected to such influences, the following may be used as good illustrations:

HERD A.

Belongs to a large school for girls on the outskirts of a city. The cow pasture was used as a playground. Of 13 head of cattle killed on account of being affected with tuberculosis, all had lesions referable to the swallowing of pointed bodies. This is shown in the following summary in which the word "adhesion" means an inflammatory process which resulted in the binding together of the liver, second stomach, and diaphragm:

ADHESIONS.

No. 1. Abscess between liver and diaphragm. Extensive adhesion of lungs to chest wall of pericardium.
No. 2. Extensive adhesions only.
No. 3. Extensive adhesions with two abscesses containing a piece of wire and a hairpin.
No. 4. Slight adhesions only.
No. 5. Slight adhesions only.
No. 6. Extensive adhesions; also adhesions of lungs.
No. 7. Slight adhesions; also adhesions of lungs.
No. 8. Extensive adhesions. Large abscess attached to lungs contains a hairpin. Adhesion of pericardium to heart.
No. 9. Adhesion of lungs to each other and to chest wall.
No. 10. Extensive adhesions with abscesses; also adhesions in chest.
No. 11. Moderate adhesions with abscesses.
No. 12. Extensive adhesions with abscesses. One abscess contained hairpin.
No. 13. Extensive adhesions. Abscesses in liver.

HERD B.

Belongs to a large school for boys. Pasture large, not used for any other purpose. Of 28 animals killed on account of being affected with tuberculosis only one had adhesions about the second stomach.

It should be noticed that the diseased condition caused by the penetrating wires (chiefly hairpins in Herd A), was responsible also for quite extensive inflammation about the heart and lungs (pleuritis and pericarditis).

Other herds in the suburbs of a large city which were pastured on unfenced ground were found affected more or less like Herd A. Thus in one herd, of 10 head killed 4 were found affected with adhesions more or less extensive. Three of these also had abscesses.

In another herd, 4 were killed and 3 found affected. Of the latter 1 had abscesses in the liver, another a foul smelling abscess in the lungs.

In a third herd, 4 out of 11 showed the effects of having swallowed pointed bodies.

It might be claimed that in many of these cases permanent injury to the health of the affected cattle or to their productiveness could not result from the conditions noted above; but a second thought will convince any impartial reader that such a claim is quite erroneous. The severe inflammatory action resulting in the formation of abscesses about the second stomach, the binding of the liver and the second stomach to the diaphragm, the presence of foul abscesses in the liver and in the lungs, and the adhesions of the lungs must surely more or less reduce the vitality of the affected animal. More than this, the offending body often penetrates the heart wall itself, resulting in a hemorrhage which in many cases proves rapidly fatal.

A compilation of the number of cattle which have succumbed to traumatic disease due to the presence of foreign bodies would probably show a high mortality. Such cases have not infrequently come to our notice. The losses due to it throughout the whole country would, if they could be accurately calculated, make the subject appear worthy of close attention on the part of cattle owners. Many animals die suddenly and without apparent cause, and if all such were examined the cause of death in a large percentage of causes would probably be traced to the swallowing of pointed objects.

The frequency of certain traumatic diseases in cattle is thus due to the carelessness of the owners or the attendants of cattle. The milkmaid drops pins and hairpins, the workmen lose or throw away nails, and in removing wire from baled hay are indifferent as to what becomes of the small, broken pieces. The increased use of wire in the construction of fences and for telegraph and telephone lines, etc., leads to the scattering of small pieces along roads and on pastures.

Cows should not have access to rubbish heaps or to sweepings from buildings, for in these the dangerous objects lie concealed. Care should be taken that all pieces of wire are promptly placed beyond the reach of cattle. Throwing such things upon fenced or unfenced pastures should be studiously avoided. This is a disease without any promise of a cure, but is one for which even the least intelligent can practice daily prevention without any material expenditure or extra labor.

PRELIMINARY INVESTIGATIONS OF UNKNOWN DISEASES IN TURKEYS.

WASHINGTON, D. C., *September 3, 1894.*

SIR: I respectfully submit the following report on certain unknown diseases of turkeys, investigated by me at Kingston, R. I., in accordance with your instructions.

Very respectfully,

THEOBALD SMITH.

Hon. J. STERLING MORTON,
Secretary of Agriculture.

Specimens sent during the past year by Mr. Samuel Cushman, poultry manager of the Rhode Island Agricultural Experiment Station, had been previously studied by me, and certain preliminary conclusions reached which were fully confirmed and extended in the course of the work in Rhode Island. The same gentleman, through his acquaintance with the territory about Kingston, succeeded in furnishing me with plenty of material for investigation, hence little time was consumed by me personally outside of the improvised laboratory, excepting what I deemed necessary in collecting information concerning certain features of the disease under observation.

I was enabled to examine, in all, fifty turkeys of different ages, only a few of which were dead before they came into my hands. A few were purchased because they showed scarcely any signs of disease during life. Only two or three were chosen from a flock, hence our material came from a considerable number of flocks spread over a wide territory. The prominence of Block Island as a rearing place for turkeys made it desirable to get some animals from this island as well as from the mainland. Several turkeys were received from Fishers Island, N. Y. (near New London, Conn.).

Besides the living animals, I examined the entrails of about twenty-five turkeys dressed for the market by a dealer living some 5 or 6 miles from Kingston, R. I.

The immediate outcome of this investigation, extending over a period of three weeks, was the determination of two diseases probably infectious in character:

(1) A cæcal and a liver disease, caused by minute animal organisms (protozoa).

(2) A diphtheritic disease of the cæca, probably due to bacteria.

Besides these diseases, numerous tapeworms were found in many of the animals, which could not but be injurious to the birds, especially at an early age, and which might be safely regarded as a third cause of disease and death.

The first disease is the most serious and the one found most frequently. It is a slowly progressive disease, somewhat akin to tuberculosis (with which this disease has been frequently confounded, I am told). Its traces are found at all ages, some birds dying when 3 months old or at a younger age, others living until the fattening period, before the fall and winter holidays. It is probable that the disease begins at an early age, and that the time of death depends on a variety of accessory, unfavorable conditions.

No definite information was obtained concerning the ways in which turkeys contract this disease, because the time was too limited for me to study the development of this slow disease. This part of the work can be carried on here without any undue loss of time.

Though I was authorized to visit Connecticut and Massachusetts, I did not deem it best to spend any time in these States as long as the means for investigation at the Rhode Island Experiment Station were so favorable. It is highly probable that the disease prevails in Connecticut. It exists in Massachusetts, for I was able to demonstrate it in a turkey but 3 or 4 weeks old while studying the pseudo-tuberculosis of sheep in Berkshire County, Mass., in June, 1894. It appeared of more importance to determine the presence or absence of this disease in territories at some distance from such an infected center as Rhode Island. Inasmuch as the States bordering on the district are said to contain many flocks of turkeys, it would be of importance to determine whether or not the disease exists in them. If it does not, or if a territory free from this disease can be found anywhere, the New England people should be advised to destroy their flocks and begin over again with animals from States not infected.

Further investigations are therefore required to determine—

(1) The distribution of the disease over the United States.

(2) The mode of infection of turkeys, whether direct, i. e., from one to another, or indirect, through insects or other still unknown agencies.

(3) Some knowledge of the life history of the protozoan parasite, its destructibility by drying, disinfectants, etc.

Owing to the peculiar nature of the malady, the use of remedies to check or abort the disease does not appear very promising. I am inclined to think that eradication of the disease by destruction of flocks that are infected, thorough disinfection, and restocking from noninfected localities will be in the end successful. These suggestions may, of course, require revision as the investigation progresses.

BLACK QUARTER.

By D. E. SALMON, D. V. M.,
Chief of Bureau of Animal Industry, U. S. Department of Agriculture.

Black quarter is a disease which is also known by the names "black leg," "quarter ill," and "symptomatic anthrax." It is caused by bacilli, which multiply locally, or, in some cases, also, in the interior of the body. The multiplication of these germs leads to extensive alterations of the parts affected, and is accompanied by the formation of gas, which distends the tissues and causes a crackling sound when the swellings are pressed upon. The disease is usually fatal in its results.

GENERAL CHARACTERS AND CAUSE.

Black quarter has until recent years been described as of the same nature as anthrax, and was considered to be a form of that disease. For this reason it is still referred to by some writers as symptomatic anthrax. It has been known, however, for a long time that it does not spread by contagion, and that the meat of affected animals might be consumed by man or by carnivorous animals without causing the appearance of the disease in man. This fact indicated a great difference between black quarter and anthrax, as the latter is deadly to man or animals which consume the meat from affected carcasses. Observations and experiments made by Walraff in 1856, Pfisterer in 1870, Feser in 1860 and 1875, and still later by Bollinger, Arloing, Cornevin, and Thomas, and Kitt and Kitasato, have clearly established the characters and nature of the disease.

It has been shown that black quarter is a bacterial disease of cattle which is enzootic in certain districts where it remains and affects animals year after year. Its existence appears to depend considerably upon the character of the soil. There are stables and pastures in some sections of the world, particularly in the Alps, where this disease occurs during the whole year, but it is seen principally during the warm season of summer and fall. It is most common on swampy or wet lands, or those which contain a large proportion of organic matter.

It most commonly affects cattle from 1 to 2 years old, and is usually confined to those from 6 months to 4 years old, although in rare cases it may affect calves or old cattle. Calves are less susceptible than older animals, as has been shown by experimental inoculation, which partly accounts for their freedom from the affection, but while feeding upon milk they are less exposed to the contagion than when grazing. Both factors, therefore, operate for their protection.

The old cattle which have been raised in a region infected with black quarter are supposed to be immune because they have had a mild attack of the disease during their growth and they in that way become insusceptible. It is known that one attack confers immunity in every case.

The disease is easily inoculated with cattle and sheep, and to a less extent with goats. Sheep and goats are said to contract the disease spontaneously, as well as cattle. Guinea pigs are very susceptible. When horses, asses, and white rats are inoculated the only result is a local swelling, which in time disappears. Some animals enjoy a natural immunity from this contagion, and inoculation with them produces no results. Among these may be mentioned swine, dogs, cats, rabbits, and black rats. Man is also unaffected by this bacillus. There appears to be some doubt as to whether horses contract this disease, although recently one or two observations have been recorded which indicate that the horse is sometimes affected.

The bacillus of black quarter is anaerobic; that is, it is unable to multiply in the presence of oxygen. When in the soil where it does not come in contact with the air, or in the tissues of an animal, or in culture liquids, protected from oxygen, it develops rapidly, and produces considerable quantities of gas. The germs are motile in liquids, and have at one of their extremities a spore which causes an enlarged end. They are found in abundance in affected tissues, the bile, and the intestinal contents. They are seldom found in the blood, and inoculations made with this liquid usually produce no effect.

On account of the formation of spores in the bacilli the contagion has great powers of resistance and is preserved for a long time under the various atmospheric conditions to which it is likely to be subjected.

The strongest disinfectants are required to insure the destruction of the germs. For this purpose bichloride of mercury (corrosive sublimate), one part to a thousand of water, or a 5 per cent solution of carbolic acid may be used. It should be remembered, however, that these solutions, particularly the former, are very poisonous, and care must be observed to prevent injury to people or to animals.

It is supposed that animals are always infected through sores or wounds of the skin or mucous membranes. These injuries must be deep enough to reach the connective tissue or these bacilli are unable to multiply. In the skin and mucous membranes there is too much oxygen to allow their growth, but when they reach the connective tissue beneath these organs they find a situation that is favorable. Animals, therefore, appear to be infected through wounds received in pastures, either by stubbles or briars which break the skin of the limbs or by hard and sharp substances which puncture the mucous membrane of the mouth during mastication. These injuries become infected by earth or dust containing the germs coming in contact with them. The symptoms of the disease appear in from one to five days after infection, the average being about two days.

SYMPTOMS.

Black quarter is characterized by both local and general symptoms. The general symptoms are those of fever. Locally there appears a tumor, which is at first a small, warm, and tender swelling that extends rapidly and may cover a large surface of the body, and which, when lightly pressed upon, gives out a crackling or crepitating sound, due to the gas which it contains. For the same reason it is resonant on percussion.

Following the development of the swelling there also appears a secondary enlargement of the nearest lymphatic glands. If the muscles of one of the limbs are affected, which is usually the case, there is more or less lameness, according to the location of the tumor. The disease

progresses rapidly and generally terminates fatally in from twenty-four hours to three days.

The swelling due to the local multiplication of the germs of this disease may appear in various parts of the body, most frequently on the thigh, the neck, the loin, or the croup. It is never seen below the knee or the hock. Very soon the central portion becomes cold, insensible, and the skin over it is dry and gangrenous. If cut into at this time very little pain is caused, and there escapes a dark-red, frothy liquid, which has a peculiar, unpleasant odor. Usually but one tumor appears. Sometimes, however, several develop, which may by their enlargement become united into one.

The most prominent of the general symptoms are sudden loss of appetite, suspension of rumination, with great prostration, weakness, and high temperature of the body. The lameness may vary from a slight irregularity in the walk to complete paralysis of the limb. As the disease progresses there is trembling of the muscles and difficulty of breathing. Occasionally there are violent colics.

APPEARANCE AFTER DEATH.

The skin over the swelling is affected with dry gangrene. The connective tissue beneath the skin is infiltrated with blood and bloody serum, and is distended with gas. The affected muscles are dark brown or black, they are easily torn, and the spaces surrounding them are filled with bloody liquid and gas. The color is deepest at the center, shading off toward the edges; when opened the color becomes brighter by contact with the air. By compression thick blood escapes, which is charged with gas and has a disagreeable odor. The gas of the tumor is combustible and burns with a blue flame, being, according to Bollinger, carbureted hydrogen. The abdominal cavity sometimes contains a considerable quantity of bloody effusion. The mucous membrane of the intestines may be congested or inflamed and the contents of the bowels covered with blood. The liver is congested, but the spleen is usually normal. The flesh decomposes rapidly, and the carcass is soon greatly swollen by the accumulation of gas under the skin and in the body cavities.

It is sometimes desirable to determine whether an animal is affected with black quarter or with an anthrax tumor, or with a swelling caused by the bacillus of malignant œdema. The anthrax tumor may be distinguished by the hardness and solidity of the tumor, and the fact that it contains no gas. The spleen is enlarged in anthrax, and is unaffected in black quarter. It is difficult to distinguish between the swelling of black quarter and malignant œdema. They resemble each other very closely, and both are distended with gas. Malignant œdema generally starts from a wound of considerable size. It often follows surgical operations, and does not usually follow from the small abrasions and pricks to which animals are subjected in pastures.

TREATMENT.

As this disease is usually contracted on infected pastures, the cattle should be changed to other parts of the farm when it appears among them.[1]

[1] Pastures have been know to produce the disease year after year until plowed up and tilled for several years, after which no further cases occurred when the land was sown to grass.

The carcasses of those that die should be either burned or deeply buried and covered with fresh lime in order to hasten their destruction.

The stables in which sick animals have been kept should be thoroughly disinfected. To accomplish this they should be cleaned as thoroughly as possible with the ordinary stable implements, and then scrubbed with a 5 per cent solution of carbolic acid; afterwards the walls should be whitewashed.

The treatment of diseased animals usually has little effect and nearly all die. When attempted, the most promising measures are, first, to make large incisions into the tumors to allow the liquids to escape, and then to treat the wounds with a solution of carbolic acid. Internally give spirits of turpentine in doses of 1 to 2 ounces. This should be shaken up with oil or beaten up with eggs in order to protect the mucous membranes of the mouth and throat from its irritating effects.

As the animals in the best condition are most susceptible to this disease, attempts at prevention have been made with considerable success by reducing the condition of the animal in various ways. When the disease breaks out among a lot of young cattle some owners bleed all those which remain well, and repeat this bleeding two or three times. Others put a seton in the dewlap, which sets up a discharge and in that way reduces the condition. Still others give diuretics and laxatives to reach the same result. The remedies most frequently given are nitrate of potash, sulphate of soda, epsom salts, sulphur, and lime. A mixture much used in the West, and which is usually successful, is composed of 10 pounds of sulphur, 6 pounds of copperas, 3 pounds of saltpeter, and 3 pounds of air-slaked lime. Pulverize and mix and use in the salt trough in the proportion of a pint of mixture to a gallon of salt.

Vaccination as a preventive has of late years been adopted in many countries, and appears to be quite successful. The vaccine is prepared by drying pieces of the muscle taken from the tumor of an affected animal and afterwards heating it for a definite time at a temperature of from 85 to 100 degrees C., according to the strength of the vaccine required. The dry vaccine may be preserved for a long time, and before being used is mixed with water and filtered. It is then injected under the skin of the tail with a hypodermic syringe. The dose and operation vary somewhat, according to the preparation used, and full directions should consequently be obtained from the manufacturers before any cattle are vaccinated.

ACTINOMYCOSIS OR LUMPY JAW.

By D. E. SALMON, D. V. M.,
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This disease, which was formerly known by veterinarians as *osteosarcoma*, is an infectious disease of cattle, which may also attack other animals and man. It is caused by a fungus called the actinomyces bovis, which generally leads to the development of tumors about the head or neck, and which may in addition attack the lungs or other internal organs. The disease was known as wooden tongue when it affected this organ, because it increased the size and made the flesh very hard, like a piece of wood. The changes produced in the lungs were not looked upon as of the same nature as the tumors of the head until after the discovery of the actinomyces fungus. In this situation it was probably often thought to be tuberculosis. The fungus was probably first seen in 1860 by Perroncito and Rivolta. It was also observed in 1870 by Hahn. Bollinger was the first to carefully study the germ and give an exact description of it, and to demonstrate its effects in the production of the disease. This he did in 1877.

The fungus was studied botanically by Harz, who gave it the name of actinomyces or ray fungus. Since then the disease has received much attention and investigation, and has been studied with special care by Israel, Ponfick, Boström, and Wolff.

Causation.—The tumors and abscesses of this disease, wherever they are situated, are found by microscopic investigation to originate from the presence of the actinomyces. On opening these different lesions, a careful examination with the naked eye or with a hand lens will often reveal minute granules, which vary from a very light yellow to a sulphur yellow color. They may be abundant or they may be very scarce, and are found both in the soft tissue of the tumor and in the pus of the abscesses.

When these granules are separated and examined they appear as small globular masses about one-fiftieth of an inch in diameter. If they are crushed and examined under a microscope their outer portion is seen to be made up of club-shaped bodies, radiating from the center of the mass and making a body of the shape of a rosette. The interior of the rosette is found to be made up of very fine filaments, which probably connect with the club-shaped bodies. If the preparation is treated with a dilute solution of caustic soda or potash, this brings out the structure of the bodies more clearly. In some cases there is a deposit of mineral salts which obscure the structure of the granules, and in that case the examination is facilitated by treating them with weak acetic acid, which dissolves the lime salts and increases the transparency.

When these rosette-shaped bodies, or minute fungi, gain an entrance into the tissues and multiply there they set up an irritation which develops into inflammation, and leads to the formation of swellings and

abscesses. After having begun to multiply in the tissues there appears to be no limit to their increase, and consequently the tumors continue to enlarge and the discharge of pus to increase until the strength of the animal is exhausted, and death results from this cause.

The exact nature of the parasite and its place in a systematic classification appears not to have been settled by botanical investigators. Some have considered it a true fungus, while others place it with the higher bacteria. This fungus grows in nature upon various plants, particularly upon the heads of barley and other grains, and probably also upon a variety of grasses. The beards and straw of the affected plants contain the parasite, and when these puncture the skin, or the mucous membranes, the fungus is introduced, and the disease starts from this point of inoculation.

While the actinomyces may penetrate the tissues in various parts of the body, they generally enter through the mucous membrane of the mouth. When the animals eat the plants upon which the fungus is growing the mucous membrane may be punctured by sharp woody pieces or these may gain lodgment at the side of a tooth. When once introduced into the tissues they continue to grow and invade the neighboring parts. A favorite place for the multiplication of the germ is the connective tissue beneath the skin of the jaw. In European countries it very frequently affects the tongue, but in the United States this form of disease appears to be rare. The fungus may also reach the lungs and multiply there, but the manner in which it gains access to these organs is not definitely known. It is found, however, that a considerable proportion of the animals which have the tumors on the jaw also have disease of the lungs, particularly if these discharge pus into the mouth. In rare cases the fungus appears to gain entrance to the interior of the blood vessels, when it is carried throughout the body with the blood, and the diseased process is found progressing in a considerable number of organs. In this case it is said to be generalized. The fungus is also said to penetrate the body through the orifices of the teats, and in this case it sets up an inflammation of the udder.

There has been considerable difference of opinion about the inoculability of actinomyces, and many investigators who have made experiments to transmit the disease from one animal to another have failed. It appears to be difficult or impossible to produce it in an active form by inoculation with the discharges from the swellings or abscesses. It may, however, be transmitted by inoculation if pieces of the diseased tissues are introduced beneath the skin or in the abdominal cavity of healthy animals. This fact would appear to indicate that the fungus is most virulent when it is growing upon some solid substratum, such as the tissues of animals or plants.

Symptoms.—The presence of actinomycosis is generally made apparent by a swelling in locations where it may be readily seen and examined. When the tongue is affected the animal finds it difficult to eat, the tongue is swollen painfully, and in the advanced cases hangs from the mouth with abundant salivation. When the pharynx is affected there is difficulty of swallowing, and when the larynx is involved there is a difficulty of breathing. Most frequently in this country the tumor is seen on the external surface of the jaw. It usually begins in the connective tissue beneath the skin, but soon extends to the bone, which it penetrates, causing this to become thickened and porous. The swelling is at first hard, but later it softens and an abscess forms in the interior which generally opens on the external surface of the body, but may also form a channel into the mouth.

The newly formed tissue of the tumor increases in amount until it gradually forces its way through the opening, and projects from this in the shape of a mushroom, being constricted by the small aperture in the skin. The swelling may increase in size until it reaches 6 to 10 inches in diameter.

In some cases the disease begins in the interior of the bone, the fungus having entered through the alveolus of a tooth, but the process of development is the same as when it first lodges in the soft tissues. The tumors which have reached an advanced stage of development present a large raw surface of newly formed tissue which is covered with pus that escapes from numerous channels and constantly drops from the diseased mass. Such tumers may appear on either the lower or upper jaw, or on other parts of the head or neck. When the lungs are affected there may be no visible symptom, or there may be a cough and loss of flesh, as in other chronic lung diseases.

In England the disease appears to be most generally localized in the tongue; in Denmark the soft parts of the head are oftenest affected, while in some parts of Germany it is most frequently seen as a swelling of the pharynx. In this country, as is well known, it most frequently attacks the lower jaw.

Cruikshank mentions the case of a bull in England in which the skin of the flank became extensively diseased, and this process extended to the scrotum. The skin was covered with a leathery crust and its vitality destroyed. When pieces of this dead skin were pulled away pus was seen beneath it, penetrating into the connective tissue, and the yellow fungi could be easily made out. In certain cases the disease may be found in the stomach, intestines, the mesenteric and bronchial glands, and in the various, bones, joints, and muscles.

The diagnosis of the large tumors on the head and neck is generally easy, as their location and appearance is in most cases sufficient for this purpose. In case of doubt, a microscopic examination of the discharge or of the tissue from the tumor must be made in order to determine if the fungus exists. When found in the lungs and other parts of the body the appearances resemble somewhat those seen in cases of tuberculosis, and the determination of the nature of the disease turns upon the presence or absence of the actinomyces fungus.

Prognosis.—The disease is usually chronic and of slow development, but it tends to advance until a fatal termination is reached. A very small proportion of the cases may recover spontaneously, the tumors being encysted or undergoing calcification. In most cases the disease yields readily to proper treatment, and about 75 per cent of the affected animals may be cured.

Treatment.—For a long time the only satisfactory treatment for actinomycosis was to remove the tumors by a surgical operation and treat the wound thus made with strong solutions of iodine. Many cases, particularly in the early stages, were cured in this way, but when the bones of the jaw, or the lungs or other internal organs were affected, they were beyond reach of this treatment.

About 1885 Thomassen, of Utrecht, recommended the use of iodide of potassium given internally as a cure for actinomycosis of the tongue. Between that time and 1883 he treated 80 cases, all of which were cured. Nocard called attention to this treatment in March, 1892, having used it successfully on a number of cases of the tongue disease. Norgaard, of the Bureau of Animal Industry, appears to have been the first to succeed with this treatment in the disease as it affects the jaws. In April, 1892, he treated a steer with a tumor on the jaw, measuring 15½ inches

in circumference, from which there was an abundant purulent discharge. This steer was entirely cured. The Bureau of Animal Industry afterwards purchased and treated 185 head of affected animals in all stages of the disease, and cured 131 of them, or about 71 per cent. In most of these cases, after treatment was finished, there was only a bunch of fibrous tissue to show where the tumor had been.

The iodide of potassium is given in doses of from 1½ to 2½ drams once a day, dissolved in water, and administered as a drench. The dose should vary somewhat with the size of the animal and with the effects that are produced. If the dose is sufficiently large there appear signs of iodism in the course of a week or ten days. The skin becomes scurfy, there is weeping from the eyes, catarrh of the nose, and loss of appetite. When these symptoms appear the medicine may be suspended for a few days and afterwards resumed in the same dose. The cure requires from three to six weeks' treatment. Some animals do not improve under the treatment with iodide of potassium, and these are generally the ones which show no signs of iodism.

If there is no sign of improvement after the animals have been treated four or five weeks, and the medicine has been given in as large doses as appear desirable, it is an indication that the particular animal is not susceptible to the curative effects of the drug, and the treatment may therefore be abandoned.

It is not, however, advisable to administer iodide of potassium to milch cows, as it will considerably reduce the milk secretion or stop it altogether. Furthermore, a great part of the drug is excreted through the milk, making it unfit for use. It should not be given to animals in advanced pregnancy, as there is danger of producing abortion.

Sanitary considerations.—The contagiousness of the disease under natural conditions is contested by the best authorities. It is plain, however, that the fungus is scattered over the pastures by the affected animals, particularly if there is a discharging tumor or abscess, and the infectious principle is perpetuated in this way. It is wise, therefore, to keep or dispose of affected animals as soon as the nature of the disease can be determined. In this way it appears that the fungus may be eradicated from the pastures, at least to a considerable extent, and the cause of infection removed.

It is not known that people can contract this disease from eating infected meat. Cases of it have been observed in man, but the individuals appear to have become infected in the same way that cattle do, by chewing grain or straw in which the fungus was growing. When the tumors in the carcass are small, not larger than the size of a walnut, and not generalized, the affected parts should be destroyed and the remainder may be used for human food. When, however, the disease is sufficiently developed to cause large swellings and abscesses which are freely discharging pus, and when the general health of the animal is affected, the carcass should be condemned, as the meat is not in a proper condition for food. The carcass should also be destroyed when the lungs or internal lymphatic glands are affected, or when there are a large number of centers of disease scattered throughout the body.

AUSTRALASIAN MEAT TRADE.

[Prepared by A. & M. Reynolds, Balmain, New South Wales, September 3, 1894.]

Australasia, as the seven colonies of Australia, New Zealand, and Tasmania are called, is specially anxious at the present time about disposing of her immense surplus stock to advantage. Her activity in this direction should interest Americans, because when she gets that trade into full swing Americans will find her a formidable competitor for the meat markets of England or any other country that consumes more than it produces. It may be said in starting that there is scarcely need to deal with the technical aspects of the industry, because Australasia has so far kept pretty well to the same methods as are followed in America—such as the systems of refrigeration, etc. The different conditions of the Australasian trade—for instance, that of having to ship the meat four or five times farther by water than Americans have to in order to reach the European markets—will no doubt give rise to many variations from American practice.

A NATIONAL MATTER.

Already the subject is receiving the keen attention of all classes in Australasia, from the university professor of physics to the back-country "boundary rider;" and the considerable space devoted to the subject by the leading daily papers and by the modest country ones is evidence of the general interest aroused. The financial and commercial troubles that came to a head in Australia in 1893 have caused more muscle and brain than heretofore to be devoted to developing the agricultural resources, and no doubt the present activity is partly due to that, but the large surplus of stock for disposal is the main cause. The prospects of nearly every possible foreign market have been inquired into on the spot by members of government, commissioners sent by the government, and representatives of large business firms. For instance, the government of New South Wales commissioned their chief inspector of stock to inquire into the openings for trade in Europe, and Victoria fitted out two delegates with samples of various products and sent them to India, China, and Japan to endeavor to open up markets there. In fact, the question is regarded somewhat as a national one, and the governments are not slow to encourage the industry in other ways—by erecting cold-storage buildings and in some cases giving bonuses. It has even happened that local agents have advised the European firms they represent to take up the establishment of cold-storage depots for receiving Australasian fresh meat. Several of the large meat-exporting companies already in existence are largely increasing their strength, while new ones are being projected. One of these is encouraged and supported by many of the principal finance and agency companies and banks; and as it aims at giving the profits to the producers themselves, by securing the cooperation of the producers as shareholders, it bids fair to succeed.

INFLUENCE ON SHEEP BREEDING.

A marked feature of the last of the large annual sales of stud sheep in Australia was the number of long-wooled sheep offered from New Zealand and the prices given, the demand being due to the increased attention given in Australia to raising crossbreeds for the meat market. The mass of literature on how best to breed for that purpose corresponds with the business activity; and, of course, an important question in Australia, with its immense merino flocks, is how best to utilize the merino by crossing, etc. The dairying industry has taught these colonies that the tastes of the consumers must be consulted and supplied with the best quality. Especially in the past, the lean and small-sized merino did not find favor with the English consumer, but this prejudice is passing away, and probably the improvement in the quality of the merino meat is some reason for this, because the meat is now being killed and chilled near the pasture grounds and then railed to the shipping depot, whereas formerly the sheep were often traveled long distances on foot and by rail before being slaughtered and frozen at the shipping port. However, the higher prices given for the first-class crossbreeds, such as New Zealand exports, are sufficient to induce Australian squatters who live in suitable districts to purchase New Zealand long-wooled sheep for breeding purposes.

METHODS OF EXPORT.

This activity in the matter of markets and breeding is being well seconded by the attention given to ascertaining the best methods for exporting. An important illustration of this has lately occurred at Sydney, the capital of New South Wales, which is the oldest settled of the Australasian colonies. At the site of that city were landed the first few head of cattle and sheep brought to Australasia one hundred and six years ago; from its port the first frozen meat from that part of the world was exported about fourteen years ago; and now thence have been sent to England the first commercial consignments of chilled meat and live cattle and sheep. Two large steamers, the *Maori King* and the *Port Pirie*, which left Sydney for London in July and August last, respectively took each among their cargo a score of live cattle, which were housed on the deck. The latter boat also took a consignment of live sheep and about 1,000 quarters of chilled beef, which, according to reports, was chilled to 35° on shore and on board to 28¾°; and this temperature would be maintained uniform throughout the voyage by means of the Linde machine in conjunction with the thermostat invented by Dr. Shiels, of Edinburgh. These tests or experimental shipments may not at first sight appear of much importance to Americans, with their export trade in meat already so well established; but if they prove a success it will mean increased competition with America and more wealth for Australia. Hitherto Australasian fresh meat has been exported in the frozen state only, and the injurious effect of that process on the meat, especially under the present methods of thawing, are such that its value in England is said to be 1½ to 2d. per pound less than chilled meat. Those who have seen the bright, rich meat in Australia hardly recognize in London the thawed article, as it has lost so much of its natural bloom, relaxed so in form, and "weeped" or bled out so much of its juices. These defects have, it is asserted, been aggravated by some unscrupulous English traders, who sell the best of the Australian meat as English and palm off inferior quality as Australian. No doubt a combination of these causes is largely responsible for the

demand not being up to what might reasonably be expected and what it is required to be in order to absorb the bulk of the numerous stock avaliable for disposal. A leader in the movement, well supported in his sanguine hopes of the successful export of chilled and live meat, is Mr. I. H. Geddes, a Sydney merchant who has lately visited Europe and America to inquire into the industry. There are, of course, some who do not consider that the export of live cattle will become an established industry. They urge that the voyage of 12,000 miles by sea to England is too far, especially as the Australasian cattle are grass fed, and therefore will not keep up sufficient condition. Others are just as enthusiastic in support of live export, and are advocating a more complete test by sending a shipload of about 900 head in a modern cattle boat.

BOILING DOWN.

One of the first results of the low prices for fine merino wool and the depreciations caused by freezing in the value and demand for Australasian meat has been that the squatters have adopted boiling down for tallow in order to some extent reduce the surplus sheep. This is, no doubt, a rather strange expedient in these days, but it saved the Australian pastoralists from general ruin half a century back. The increase during the last few years in the number of establishments for boiling down has been marked. For instance, two of the colonies (New South Wales and Queensland) between them increased in the six years ended in 1892, the annual production of tallow by 333,500 cwt., and it has in one year so much further increased that during the year 1893 3,333,000 sheep were boiled down in New South Wales for tallow, and more than 1,000,000 in Queensland, and this number is nearly equal to the whole number slaughtered in that colony during the previous year for all purposes and markets, and many a vessel that a few years ago carried from Australia bales of the golden fleece now takes tallow instead.

MEAT PRESERVING.

Meat preserving is, of course, a preferable method for disposing of the surplus stock. In fact, there has been a rapid increase in the output of preserved meats, especially in Queensland. That colony, during 1892, preserved nearly 5,000,000 pounds of beef and mutton. Inland and seaboard companies in New South Wales, between them, consumed last year 964,500 sheep for meat preserving, and the whole of Australia exported in 1892 22,500,000 pounds of meat, mostly preserved but partly salted. The quality and general get-up of the preserved meat have received special attention. Already large European and other foreign orders have been supplied, and in such a satisfactory way as to have gained renewed orders for larger quantities of potted meats.

These facts certainly indicate a remarkable growth and push in trade; but the greatest hopes are centered in the increase of the export of fresh meat. As experts affirm that the freezing has in the past been too hard, the efforts already mentioned are being made to substitute chilling on American lines; for although slightly more costly for freight on account of the greater space taken up, it will mean, if the prices of chilled meat are maintained, a considerable profit on present methods.

NEW INVENTIONS.

Apparently, Australians will not be slow in their endeavors to discover other methods of remedying the present drawback to the export of fresh meat. New processes are already announced for thawing the frozen

meat in such a way that it may not lose its natural looks and qualities. A patent of a different kind has lately been announced in Sydney which, according to the tests so far made, may turn out to be valuable. The carcasses of the sheep are exposed for three or four hours to innoxious fumes, which slightly darken the flesh, making it smack somewhat of bacon in its raw state, but when cooked is hardly distinguishable from ordinary mutton. After that short treatment it will, it is claimed, remain fresh for twelve months exposed to the ordinary temperature. Some of the sheep have been shipped as deck cargo to New Caledonia and approved of by the French military authorities. The process is a trade secret, and has not yet been floated into a company. It is much cheaper than chilling and causes only a slight decrease in the weight of a carcass. But the patent has yet to be submitted to the test of keen competition with other methods.

STATISTICS.

A brief consideration of the following figures will indicate how great the possibilities are of a large increase in the quantity of meat exported from Australasia:

Mutton trade.—North and South America carry a population of something more than 125,500,000 inhabitants and about 143,500,000 sheep, while Australasia has a population even less than 4,000,000, and yet carries nearly 122,000,000 sheep, valued at £39,784,000. Although Australians are credited with being the largest eaters of meat, they have no intention of consuming their numerous flocks; they want to dispose of them to less fortunate people. In fact, Australasia has for disposal every year, after supplying local wants, several million head of sheep of such an age that it will pay better to slaughter than to keep them for breeding or for bearing wool. The number of these casts or culls, as they are called, has been variously estimated, and at present they are far from being used up quickly and profitably enough. There is, therefore, plenty of scope for expansion of trade merely in using up this large surplus of casts; but even they form but a small proportion of the immense flocks that would be available for disposal if demands were satisfactory. But what are the future prospects of trade, if we accept the estimate of the government statistician of New South Wales, that Australasia can carry about 126,000,000 of sheep in addition to the 122,000,000 she now has? In order to understand with what rapidity the export of frozen meat has grown, it is only necessary to state that the first shipment was made in 1880, when 555 carcasses of mutton and 60 of beef were sent to England, while during 1892 New Zealand exported frozen meat (beef and mutton) to the value of £1,113,692, Queensland to the value of £374,922, and New South Wales to the value of £282,102. Although the last-mentioned colony carries 58,000,000 out of the 122,000,000 of sheep in Australasia, and was the first of those colonies to export the frozen article, because of its wool industry being so flourishing and for other minor reasons, the bulk of the meat trade passed to New Zealand, enabling it to recover its prosperity after a long period of chronic depression, and to support at the present time about twenty freezing establishments, capable of treating 4,000,000 sheep per annum.

Beef trade.—All the colonies are more or less interested in the cattle trade; but none more than Queensland, which carries more than half of the 12,333,000 head of cattle in Australasia, valued at £57,000,000. Its prosperity, therefore, largely depends on the pastoral industry; and when the export trade sprang into existence the somewhat gloomy

outlook for stock raisers speedily brightened. Now, the export of beef in various forms is a thriving industry, some idea of which has been already given in this article. It remains here to be remarked that the amount of beef and mutton exported from Queensland in 1889 was 7,500,000 pounds, while in 1892 it was nearly 18,000,000 pounds of beef, or 23,500,000 pounds of frozen and preserved mutton and beef. Again, in 1893 the amount of beef and mutton preserved and frozen in Queensland was 35,888,532 pounds, or of beef and mutton 40,500,000 pounds, or over 39,000,000 pounds more than were preserved or frozen per annum eight years previously.

MISCELLANEOUS NOTES.

THE FLORIDA "HORSE-LEECH."

In August last a package was received by the Bureau of Animal Industry from Mr. J. J. Thompson, of Arredonda, Fla., containing a section taken from a horse afflicted by what is known in that State as "leeches." The disease, if such it can be called, has been noticed in previous annual reports of the Bureau, but up to this time no investigation has been made to determine its cause. This particular specimen was forwarded during the hottest season of the year in a simple wooden box, without precautions having been taken for its preservation. The chief of the pathological division was absent at the time of its arrival, and on his return he found it swarming with maggots—in a condition, indeed, which precluded any possibility of an examination. In his reply to the communication of Mr. Thompson, Dr. Smith stated that about two years ago a veterinarian from Florida brought him some diseased tissue taken from a horse in Florida, which had been preserved in alcohol. A very cursory examination at that time gave him the impression that the disease was not due to a "leech," but to a fungus perhaps similar to actinomycosis and the "madura foot" of India. The fungus spreads through the tissue, and the mycelium, becoming incrusted with lime salts, forms the "leech" described by the correspondent as without life and organs. There is a peculiar disease of cattle on Guadalupe Island which has been studied to some extent by French observers. According to their description it may be the same disease as "leeches" in horses in Florida.

The following is a copy of Mr. Thompson's letter:

SIR: I send you by Southern Express specimens of what are called in this State "leeches." They are unlike, in every particular, leeches found in water in other parts of the United States. They are of two forms. One has the shape of a grain of whole rice, with the hardness of stone; a person using a knife in cutting them out distinctly feels them. The hard grit causes the knife to become dull very rapidly. They are single and by two, three, and so on. I have seen them grown together in clusters not so large around but as long as the small finger, but these lengths are unusual. None are any larger than a grain of rice. The other form partakes of a gristly nature, from small particles the size of a large pin head up to those as large as a finger nail, flat, and of irregular shape. They attach themselves to no particular part of the horse, but generally the legs, and any part of the body—the belly, flanks, back, or mouth. When first discovered, a small speck of blood and water is seen, and the horse is thrown, tied, and the leech or leeches cut out. It may be one or a few. If the horse is neglected the leeches grow in number and the spot grows in size; if on the leg, generally up and down on that limb; if on the belly or side, it generally spreads around, making a shape of that of a saucer or plate and of that size, but before it gets that large they are taken up and the leeches cut out, or they kill the horse. It is seldom they attack or eat the leaders in the leg or in the intestines, confining their ravages to the flesh of the leg and the fleshy part of the belly, and when on the hip, thigh, or other thick flesh, they eat in an indefinite distance.

What this leech is, no man in Florida up to this date has ever been able to determine. Neither the unlearned nor the scientific have any knowledge of what it is or where it comes from. Our prairies have lakes and pools of water on them, and

horses go into the water to eat the grass. Sometimes they go so deep as to cover their backs with water. The most of the horses are attacked in the legs from the hock or knee to the fetlock, but generally between the hock or knee and ankle. The theory of some is that it is an insect that stings the horse which causes the leech to breed; yet all insects that sting and lay an egg not only lay one but very many eggs. Another theory is that the leech floats on the water and attaches itself to the horse, penetrates the skin, and goes to work on the flesh. The leech has no appearance of life whatever—has no legs, eyes, mouth, stomach or intestines, yet they eat and grow in numbers and spread through the flesh.

We live a few miles from Payne's, Kanappaha, and Hogtown prairies, and many of the horses are driven to the horse lot, where the operation of cutting the leeches out is performed. Have had three horses operated on this summer, all in the legs; two of them were affected in the forelegs, and one in each of the hind legs. Two operations were successful; the other was so much eaten that it died the next day, after all the leeches had been cut out. In previous years we successfully cut one from the side of the belly that had spread as large as a saucer, and two that were attached to the gums. One fine horse, worth $200, was attacked where the tail joins the body. Threw it, and found that the leeches had penetrated 6 inches up over the hips in the flesh under the skin. It was a severe case, and while the knife was being used the poor horse suffered and groaned. The outward sign was small, yet the leeches had penetrated far up the back. Had it cut to such an extent that I thought the horse would die from the operation and loss of blood. I applied a hot iron to sear the wound where cut, and let the horse up. About three or four weeks after, he broke out up near the backbone, toward the loins. All the leeches had not been gotten out. If one remains it is enough to breed a new nest. Did not cut the horse any more, as it was too far gone, but gave it to a negro. The leeches afterwards killed it.

The only remedy that has ever been successful is the knife. Corrosive sublimate and other poisons that were thought to be useful were used, but without effect.

The name of this disease, "leeches," is local to Florida, and originated by knowing that the common long black leech was a native to water. You may have some other name for them. They have been known here for generations—from the earliest settlement of the country down to this time. They are not a great pest, and if stock raisers will keep close watch, which they generally do, they do no harm. When they are cut out and the animal recovers, the horse is turned out to run on the prairie again. The leech will not specially hunt the wound to make another attack. I do not know that I ever knew a horse to be attacked a second time in the same place, and do know of one horse that was "leeched" in sixteen different places on the legs and belly at one time.

Respectfully, J. J. THOMPSON.

Another correspondent writes from Inverness, Fla., under date of September 28, 1893, as follows:

SIR: Since my removal to this State (four years ago) my attention has been called to a disease of the horse which the citizens here do not seem to understand or to treat properly, and as I can get no information from any work that I have examined on the horse, I write hoping that an investigation by your Department may furnish some light.

Horses and colts that have been feeding in the waters of shallow lakes and muck-ponds, frequently have a sore to break out on the legs or lower portions of the body, which spreads rapidly and exudes a bloody serum. The sore resembles somewhat the bloody wart, but is entirely different—it spreads rapidly and grows deeper and will prove fatal unless promptly attended to. It is called here "leeches," but why I can not say. I have a colt that was attacked about May or June last, on the front part of the left hind leg. I gave the only treatment here used, i. e., I had Mr. J. A. Hampton to cut the whole sore out and sear the flesh with a hot iron; it soon recovered. This week I found that the same colt had another attack on the right foreleg, just above the knee joint, and before I discovered it the sore was 5 inches long by 3 inches broad and fully 1 inch deep. Mr. Hampton again cut the sore away and burned the leg. The flesh that is cut away is perfectly honeycombed with the borings of a parasite, resembling to the naked eye a very small tapeworm, but bony. In cutting, all the perforated flesh must be removed to effect a cure.

I would like to find a cure for the disease without resort to the knife, as sometimes this can not be used.

Very truly, yours, J. M. YOUNG.

TUBERCULOSIS AMONG CATTLE IN SAXONY.

United States Consul Theodore M. Stephan, of Annaberg, under date of October 31, 1894, states that the following statistics as to the occurrence of tuberculosis among cattle in Saxony have been obtained from the reports of the public slaughterhouses and meat inspectors:

In fourteen towns which furnished complete statistics it is reported that 60,854 horned cattle were slaughtered; 11,349, or 18.65 per cent, of these were found to be tuberculous. Of these tuberculous animals 10,222, or 90.06 per cent, were passed as fit for consumption; 664—that is, 5.85 per cent of the tuberculous, or 1.09 per cent of the total number slaughtered—were excluded from the market, and 463—that is, 4.07 per cent of the tuberculous, or 0.76 per cent of the whole number—were entirely condemned.

Of 114,317 calves slaughtered in nine towns, it was found that 161, or 0.11 per cent, were tuberculous; 77, or 0.067 per cent, of these were entirely condemned; 50 of these were passed as inferior, and 34 as good meat.

In twelve towns 276,669 pigs were slaughtered, of which 3,802, or 1.38 per cent, proved to be affected with the tuberculosis. Of these, 2,624 were passed as good, 584, or 0.21 per cent, as inferior food, and 604, or 0.22 per cent, were totally condemned.

Among 104,987 sheep, 39, or 0.037 per cent, were detected as suffering from tuberculosis. In 32 of these cases the meat was considered good.

It is an old observation that tuberculosis occurs most frequently in cows; but incomplete statistics show that it appears to almost the same extent in oxen. Bulls alone show a very favorable contrast in this respect.

In the three slaughterhouses at Dresden, Leipsic, and Pirna statistics were obtained for the extension of tuberculosis in the body of the animal. In 7,507 cases the disease was confined to one organ. Against these, there were only 1,850 cases where the disease had spread more widely; in 344 cases several organs of one cavity of the body were affected; in 1,322 the organs of several cavities simultaneously; 308 were cases of tuberculosis of the spleen, kidneys, and lymphatics (generalized tuberculosis); 18 tuberculosis of the bones, and 58 of the udder.

Tuberculin injections for diagnostic purposes were few, owing to the trouble and expense involved, though, where used, favorable reports are received. In one case, however, it was observed that the cows lost the sexual instinct after the injection, but this may have been an accidental coincidence. In the case of a four months' old calf, boils to the size of a fist broke out on the head several times two or three days and emitted a pus-like matter. This lasted several months, and the animal did not thrive. On slaughtering, the lungs were found to be full of tubercles as large as peas. The slaughtering did not take place until after the animal had calved for the first time. The 8 days' old calf had flat layers of tuberculous deposit on the pleura.

In horses, two cases of tuberculosis were observed. In one case the lungs were totally infested with miliary nuclei, which were also found in the spleen. The horse had been kept in the cow stable. In another case a lymphatic vessel of the neck had enlarged, and a boil arose on the chest which could not be removed by an ordinary operative process. The horse fed badly and dwindled away. It was killed, and on dissection a compact mass of swollen matter weighing 25 pounds was found in the front breast adhering to the breastbone. Tuberculosis nodules as large as peas and walnuts were found in the left pleura, in the parenchyma, the lymphatic vessels, and the liver and spleen. This horse, too, had been kept for three years by the side of a cow which afterwards turned out to be highly tuberculous. The presence of tuberculous bacilli was clearly demonstrated.

XANTHIUM STRUMARIUM (COCKLEBUR).

The New Zealand department of agriculture, John D. Ritchie, secretary, in Leaflet for Farmers, No. 5, issued October, 1893, states that the young foliage of clot or cocklebur is poisonous to stock and that the burs damage wool. The plant is known by the following common name in the several countries named: Small burdock, or bur-weed (England); clot or cocklebur (America); Noogoora bur (Queensland).

The leaflet continues as follows:

This plant has, unfortunately, recently appeared in the colony, and the present leaflet is issued with a view of giving settlers an idea of its appearance, so that if plants are seen they may be destroyed without delay.

Should this plant become acclimatized it will probably cause great loss to both the cattle raiser and sheep farmer.

Some time ago the *Silverstream*, from Buenos Ayres, discharged a quantity of earth ballast, which was placed on the reclaimed land near the Wellington Railway Station. A few months later the heap was observed to be covered with a luxuriant growth of weeds, and from it I collected no less than seventeen species—many of them, unfortunately, already too well known in the colony, but two or three were new. Among these last was the subject of the present note, namely, *Xanthium strumarium*, known in England as the small burdock or bur-weed, in America as the clot or cocklebur, and in Queensland as the Noogoora bur, from the locality where it was first observed to be poisonous to stock.

The plant belongs to the composite order, but there may at first, on account of the separation of the male and female flowers, seem some difficulty in understanding why it should be so classed. A further examination will, however, show its true relationship.

The female flower heads are in small axillary clusters of two or three, the male flower heads being placed above them at the top of the branchlets. After the pollen has been dispersed, the male flowers soon drop off, and the female flower heads rapidly develop into oblong burs, very hard and thickly studded with hooked spines. On the top of the bur are to be seen two very stout beaks, and within will be found two cells, each with a single seed. The full-grown leaves, measuring from 2 to 5 inches in width, are very similar to those of mallow, with from three to five lobes, unequally and often coarsely toothed.

If a young plant is carefully dug up, the bur from which it grew will be found attached to the root.

The plant is a rank annual, and in Queensland grows to a height of 6 or 8 feet, with wide-spreading branches. Purple mottling will frequently be seen on the stems of young specimens.

In the earlier stages of development it is eaten by cattle. Mr. Gordon, the chief inspector of stock for Queensland, states that its action is to induce paralysis of the heart, causing death without struggle, and apparently without pain. Fully half the herd on the Noogoora estate having been killed by it, Dr. Bancroft, of Brisbane, undertook experiments which conclusively proved the poisonous nature of the weed.

It was introduced into Queensland with cotton from the Southern States of America.

Each plant produces numerous burs, which in a sheep country would, from their nature, cause enormous loss to the woolgrower by injuring the fiber of his chief product.

Two species *Xanthium strumarium* and *X. Canadense* are common weeds in the United States, and the fact that the young foliage is poisonous to cattle furnishes an additional reason for using every means to eradicate it.

MEAT IMPORTATION.

The following article appeared in the Landwirthschaftliche Zeitung, supplement to the Hamburger Correspondent of August 10, 1894, headed "Cattle and meat import from the United States:"

The steamship *Prussia* arrived July 27, from New York, with 340 head of live cattle and 150 carcasses. Although a more or less regular importation of cattle from the United States for killing had already taken place some years ago without having attracted any attention, the matter of importing cattle and meat now entered upon a new stage. The Hamburg Packet Company has at present two steamships running, and three building, having steerage room in each for 200 live animals comfortably stabled in two long rows. The animals appeared, on their arrival, as having been well stabled and well attended, giving no indication of the hardships of the sea voyage. They had been fed good hay and corn in the ear; the stable was well ventilated. They were unloaded immediately, placed in cars, and were at the cattle marts and slaughterhouses a few hours after the arrival of the steamship. The veterinary inspection took place at the wharf, before they were loaded into the railroad cars, while the custom inspection is held at the slaughterhouse. No loss was reported during the voyage.

In accordance with the law, cattle must be slaughtered within ten days after arrival in Hamburg. The meat is kept in cool rooms 8 feet high, with a floor space of 3,750 square eet, and located in the lower part of the vessel, near the engine. The carcasses ere quartered, each quarter put in sacks and suspended on hooks.

The temperature in the room is kept at + 2° to 3°, the best at which meat is preserved, provided the air is dry. The freezing of meat, as done with that imported from Australia, is not found necessary, on account of the shortness of the trip; the meat, therefore, if received on board directly from the slaughter or cooling houses, is in the same condition when taken from the vessel as that taken from the public slaughterhouses of Germany supplied with all the modern improvements.

There is a great difference between this and the Australian meat. This meat, kept in the cooling rooms and not frozen, if it is of young and well-fed animals, competes favorably with the better and best qualities of the home production; while the Australian meat, kept for a long time in rooms below freezing point, can only compete with the inferior quality of home production.

The meat brought by the steamship *Prussia* came from Kansas City; was shipped from there in refrigerator cars to New York. The certificate signed by an official of the Department of Agriculture stated that the cattle had been inspected and that the post-mortems had shown them free of all diseases. Each quarter was tagged and had a number. But this is not sufficient, and does not satisfy the representatives of the city government of Hamburg. Each quarter was there again carefully inspected by the veterinarians appointed for that purpose, and only when found healthy is stamped and allowed to be sold. Some quarters of this first shipment were condemned, not because of being diseased or even suspected, but because the first stages of decay were observed, showing that the arrangements on the steamship for cooling were not as yet faultless and uniform during the entire trip. But this will in time be easily remedied with increasing experience.

The meat coming from well-fed and even fat animals was immediately sent to the cooling rooms of the slaughterhouse, placed again in a temperature of + 2° to 3°, kept there, and taken away whenever needed.

As before stated, through the building of these five steamships for the live-cattle and meat importation the question becomes one of great importance. The American business men and associations, working with a very large capital are, of course, greatly interested to further extend their trade, which formerly had only been carried on with England, to create a market for their meats in Germany, and so greatly embarrass the German producers.

The Mark Lane Express of July 16 says that the value of imported live cattle from 1885 to 1893 had increased from £1,333,763 to £6,262,861, and that the value of imported fresh meat had increased from £482,802 to £4,109,593.

The importation of all the agricultural products into England increased from £15,812,659 in 1885 to £81,416,880 in 1893, or about 42 per cent, while the increase in the population was only 5.7 per cent.

Whether the next ten or twenty years will show the same for Germany, we can only surmise. The quantity, the centralization of capital, the sale of cattle and meats, also the improvements in the art of preserving, the building of suitable vessels—all these are factors of the greatest importance. This importation of live cattle leaves no doubt that they are not inferior to the best German cattle as to their outward appearance and their value for killing purposes, and that they surpass the latter as to health.

Special attention was called in a former article by Dr. Vollers, veterinary surgeon and the writer of this, to the almost total absence of tuberculosis in the live cattle imported from the United States, which fact is all the more remarkable in view of the wide extension of this dreaded disease in Germany. When we consider that the presence of this disease in American cattle is only 0.115 per cent to from 10 to 26.7 per cent in the German cattle, it is a matter of vast and vital importance, even if we take into consideration that the cattle imported from the United States are mostly oxen and selected for exportation, while the per cent of the German cattle is taken from the whole bovine genus.

STOCK HOGS FOR MARKET.

Mr. J. R. Macrae, statistical correspondent of this Department, writes as follows from Council Bluffs, Iowa, under date of December 30, 1893:

Inclosed please find a few suggestions on the handling of stock hogs, from one of my correspondents, J. B. Matthews, who is United States postmaster at Taylor, in this county. I heartily indorse all he says on the subject. In this neighborhood we would rather feed cattle, wanting hogs, than buy stock hogs out of the South Omaha yards.

The inclosure referred to from Mr. Matthews is as follows:

Allow me to suggest that there should be a law or an order made by the General Government regulating the shipping and handling of stock hogs—hogs designed for market as feeders, not as fat hogs. In every instance that has come under my observation in the last five years, where stock hogs have been shipped into western Iowa from Illinois, Missouri, or Nebraska they have invariably been affected with disease, and parties shipping them claim they were in good health at the time they were shipped.

Now, my opinion is that if the stock cars are properly cleaned and disinfected, and instead of unloading such hogs in the pens of the stock yards where other hogs have been daily unloaded and placed into, they were put into pens separate and away from the fat-hog pens and kept for the purpose of penning stock hogs alone, then they would not contract disease, and the stock-hog trade could be conducted profitably to the shipper and the purchaser who buys them for feeding purposes.

To prove that my theory is correct, Mr. Evans, a large feeder east of Carson, shipped 200 stock hogs from Illinois. He cleaned the cars and used disinfectants, and would not allow them to be unloaded at any stock yards. Even at Carson he would not allow them to pass through the loading chute, but let them out of the cars away from the stock yards, and drove them home. Those hogs have been healthy, with no signs of disease, and it is the only instance that I have known in five years where stock hogs have been shipped into this country and been healthy afterwards. I hope the Department of Agriculture will make some inquiry relating to this matter, and adopt the methods I speak of, or something better.

LAWS OF THE STATES AND TERRITORIES FOR THE CONTROL OF CONTAGIOUS ANIMAL DISEASES.

Laws of the States and Territories for the control of contagious and communicable diseases of domestic animals not heretofore published in the annual reports of this Bureau will be found below:

COLORADO.

AN ACT to amend an act entitled "An act to amend an act entitled, 'An act to prevent and suppress infectious and contagious diseases among the domestic animals of the State; and for the appointment of the necessary officers to carry into effect the same; and to fix compensation,'" approved, March 3, 1887.

Be it enacted by the general assembly of the State of Colorado, That section four of an act entitled, "An act to amend an act entitled, 'An act to prevent and suppress infectious and contagious diseases among the domestic animals of this State; and for the appointment of the necessary officers to carry into effect the same; and to fix compensation,'" approved March 3, 1887, be, and the same is hereby, amended so as to read as follows:

"SEC. 4. Section 6 of said act is hereby amended so as to read as follows: Sec. 6. There is hereby created a State veterinary sanitary board, such board to consist of three members to be appointed by the governor, by and with the advice and consent of the senate; such persons so appointed shall hold their offices for the term of two years. The State veterinary sanitary board shall, upon the request and recommendation of five woolgrowers, residents of any county in the State, appoint some practical sheepman inspector of said county, whose term of office shall be one year, unless sooner removed by the State veterinary sanitary board; said inspector's duties shall be to prevent and suppress infectious and contagious diseases among sheep, under such regulation as may be prescribed by the said sanitary board; said sheep inspector shall be paid three dollars per day for actual time employed, and his actual traveling expenses, from the sheep-inspector's fund of said county, if there be such fund, and otherwise from the general fund of said county, upon his sworn voucher being approved by the county commissioners of said county: *Provided,* That such inspector shall only inspect such sheep as are diseased or reported to be in a diseased condition."

Approved April 8, 1893.

DELAWARE.

AN ACT for the eradication of infectious and contagious diseases among the lower animals.

Be it enacted, That in order to protect the lives and property of citizens of Delaware when threatened by epidemics of contagious and infectious diseases among the lower animals, authority is hereby vested in the governor of this State to issue his proclamation stating that an infectious or contagious disease exists in any county or geographical district of the State, and warning all persons to seclude, in the premises where thay may be at the time, all animals within the quarantined district that are of a kind susceptible to contract the disease in question, and ordering all persons to take such precautions against the spread of such disease as the nature thereof in his judgment render necessary or expedient.

SEC. 2. To call upon all sheriffs and deputy sheriffs to carry out and enforce the provisions of such proclamations, orders, and regulations; and it shall be the duty of all sheriffs and deputy sheriffs to obey and observe all orders and instructions which they may receive from the governor in the premises.

SEC. 3. To employ such and so many medical and veterinary practitioners and such other persons as he may from time to time deem necessary to assist in performing his duties, as set forth in the first section of this act, and to fix their compensation.

SEC. 4. To order all or any animals coming into the State to be detained at any place or places for the purpose of inspection and examination.

SEC. 5. To prescribe regulations for the destruction of animals affected with infectious or contagious disease, and for the proper disposition of their hides and carcasses, and of all objects which might convey infection or contagion: *Provided*, That no animal shall be destroyed until first examined by a medical or veterinary practitioner in the employ of the governor as aforesaid.

SEC. 6. To prescribe regulations for the disinfection of all premises, buildings, boats, and railway cars, and of all objects from or by which infection or contagion may take place or be conveyed.

SEC. 7. To take such action in regard to exposed carcasses, bones, etc., and to graves of lower animals known to have died from diseases directly communicable in a fatal form to man as he, after consultation with well-informed persons, may deem to be expedient.

SEC. 8. To alter and modify, from time to time, as he may deem expedient, the terms of all such proclamations, orders, and regulations, and to cancel and withdraw the same at any time.

SEC. 9. For the purpose of defraying expenses involved in carrying out the provisions of this act an annual appropriation, not to exceed five hundred dollars, or so much thereof as occasion may require, is hereby made from the funds of this State.

Approved, May 4, 1893.

IDAHO.

AN ACT for the appointment of sheep inspectors, and to suppress and prevent dissemination of scab among sheep.

Be it enacted by the legislature of the State of Idaho, That there shall be appointed by the county commissioners in each county in Idaho, upon the petition of a majority of the resident sheepgrowers, a capable and discreet person and practical sheepgrower as inspector for such county, to hold his office during the pleasure of such county commissioners, or until his successor shall be appointed, and who shall perform such duties as are hereinafter provided, or he shall be removed as hereinafter provided, upon petition of the majority of the stock owners paying taxes in said county, presented to the county commissioners.

It shall be the duty of such county commissioners of any county wherein such petitioners pay taxes to remove such inspector and appoint the person named in the petition.

SEC. 2. Such inspector shall be a resident of the county for which he shall be appointed. He shall, before entering upon the duties of his office, take the oath prescribed by law for other county officers, and shall give bond to the county wherein he is appointed in the sum of two thousand dollars, with good securities conditioned that he will faithfully perform the duties of his office.

Such bond shall be approved by the county clerk and the chairman of the board of county commissioners, who shall indorse every bond they shall approve as follows: "We are acquainted with the sureties herein, and believe them to each be worth the amount of the penal sum of the within bond, over and above all their just debts and liabilities."

SEC. 3. Such bond, with the oath indorsed thereon, shall be recorded in the office of the clerk of the board of county commissioners of the county in which the inspector shall reside, and may be sued on by any person injured on account of unfaithful performance of duty by such inspector or any of his deputies: *Provided*, No suit shall be instituted after twelve months have elapsed from the time the cause of action accrued.

SEC. 4. It shall be the duty of the inspector to administer oaths and to personally examine all sheep and bands of sheep in his county every spring, between the fifteenth day of April and the fifteenth day of May, and to the owners or persons in charge of herds found to be clean shall so certify, which certificate shall be a permit for such herds to pass into and through any and all counties in this State so long as they shall remain free and clean from disease; and also to examine any band or bands of sheep at any time that he may be called upon to do so by the request of three or more sheepgrowers in writing, said persons making a written statement that said sheep are affected or infected with some infectious or contagious disease, and that there is imminent and immediate danger of the spreading of such disease.

Such inspector shall forthwith issue his order, quarantining said sheep. Each inspector shall have power to appoint one or more deputies, who shall be practical sheep men, for whose acts he shall be responsible, and by any of whom he may perform any acts required of him by this act, except the annual inspection, which shall be made by the inspector himself in person; and it shall be the duty of the

inspector to advertise in at least one local paper, if there be one in his county, at his own expense, the names and post-office address of any and all of his deputies.

SEC. 5. Any person, company, corporation, or association intending to bring or cause to be brought from any other State or Territory into any of the counties of the State of Idaho any sheep, must first obtain from the inspector duly appointed under this act a certificate that said sheep are sound and free from all contagious disease before crossing the boundary line of said county; and it shall be the duty of every inspector at the request of any person, company, association, or corporation owning or controlling any sheep of his county, or within twelve miles of the line of said county, upon being tendered the amount of his compensation for other special examinations, as herein provided, to with all convenient speed examine any sheep he shall be requested so to examine; and if such sheep be found free from all infectious and contagious disease, and are perfectly sound, to give his written certificate to said applicant over his official signature, setting forth the soundness and freedom from disease of such sheep; and issue a permit, as provided for in section 4 of this act: *Provided*, That any sheep that have been previously examined by any of the inspectors of this State but have been grazing without the State may return at any time within the year without additional examination. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than three hundred dollars ($300), nor more than five hundred dollars ($500).

SEC. 6. Any person, company, corporation, or association desiring to move his or their sheep which are not sound, or are infected or affected with scab or any infectious or contagious disease, shall obtain from the inspector a traveling permit, but such permit shall only be granted for the purpose of moving said sheep to some place where they may be treated for said disease, and by such route as the inspector may designate. Any person, company, or corporation violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than three hundred dollars nor more than five hundred dollars; and any party injured or damaged by reason of the moving of said sheep shall be entitled to recover from said person, company, or corporation, by a civil action, three times the amount of damage, direct and consequential, that said party has actually sustained by reason thereof.

SEC. 7. Whenever, upon an examination of any bands or herds of sheep kept or herded in any county of the State of Idaho, the sheep inspector shall find such sheep, or any portion of them, affected with the scab, or scabies, or any infectious or contagious disease, he shall forthwith notify the owner or person in charge of said sheep, in writing, to treat said sheep for said disease within a period of fifteen days from such notice, and also during such period to keep said sheep from contact with other sheep by such means as he may specify; and if, upon examination at the end of fifteen days from such notice, the inspector shall find that said sheep have not been treated for said disease or have not been kept from contact with other sheep that are sound, the owner or owners or person or persons controlling said sheep shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than one hundred dollars nor more than two hundred and fifty dollars; and in case said sheep have not been treated for said disease the inspector shall immediately take possession of said sheep and treat them for said disease; and all expenses incurred in so doing, including a compensation of five dollars per day for every day or part of a day in which the inspector may be engaged in treating said sheep, shall become a lien upon said sheep, and the inspector shall hold the sheep until the same is paid; or if it be not paid within ten days after such treatment has been completed he shall collect the same, together with the costs and expenses of collection, by advertising and selling said sheep or so many thereof as may be necessary in the manner prescribed by law for the sale of personal property on execution. If, however, upon examination at the end of thirty days from such notice as before mentioned, the inspector shall find that said sheep have been treated for said disease but are still infected with the same, then he shall instruct the owner or controller of said sheep to dip once or more times, as circumstances demand, as soon as possible, but with an interval between the dipping of not less than nine nor more than twelve days; and if upon examination at the end of thirty days further the inspector finds that said sheep have been treated for said disease but are still affected, then he shall at once take possession of said sheep and treat them for said disease as above specified.

If, however, upon examination, he finds said sheep have not been treated for said disease, he shall seize said sheep and treat them for said disease, as above specified, and the owner or owners or controller shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than one hundred dollars nor more than two hundred and fifty dollars: *Provided*, No person, company, or corporation shall be required to dip any of their bands of sheep from the first of December until such time as they can shear the following spring: *And it is further*

provided, No person, company, or corporation shall be required to dip a band or bands of ewes, or any part of them, in which there are ewes with lambs at any time from the 15th of March until the 15th of May of any year, but they must be held in quarantine and kept separate from sound sheep, and held responsible for all damages, as stated in sections 6 and 7 of this act. It also shall be the duty of the inspector to require the owner or owners of sheep while held in quarantine during the above exemption to spot or hand dress all sheep in their band that show any scab or any contagious disease with some reliable medicine that he may recommend for the purpose, and the inspector shall have power to enforce hand dressing or spotting during the exemption referred to in this section the same as he has the power to enforce dipping at any other period of the year.

SEC. 8. The sheep inspectors of the several counties of this State shall receive five dollars per day for every day or part of a day spent in the performance of their duty and ten cents per mile for every mile necessarily traveled in the performance of their duties, to be paid by the owner of the sheep examined, as provided in section 7 of this act. All deputy inspectors to receive the same pay and in the same manner as the regularly appointed inspectors.

SEC. 9. Any inspector at any time granting a permit allowing sheep to travel without having at the time first examined said sheep shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than one hundred dollars nor more than two hundred and fifty dollars.

SEC. 10. Any person or persons owning or having under their control sheep or bands of sheep which have become afflicted with scab or other contagious disease for the period of fifteen days without reporting the same to the inspector in writing shall be deemed guilty of a misdemeanor, and shall upon conviction thereof be punished by a fine of not less than twenty-five dollars nor more than two hundred and fifty dollars. Upon receiving such notice the inspector shall proceed as provided in section 7 of this act. Any person, company, or corporation violating any of the provisions of this act shall be liable in a civil action for all damages sustained by any other person, company, or corporation in consequence of such violation.

SEC. 11. In any action or proceeding, civil or criminal, arising under this act, all persons having an interest in sheep and controlling the same concerning which such action or proceeding is had shall be deemed the owners of such sheep, and shall be liable, severally and jointly, for a violation of this act. Any herder, shepherd, or other person in charge of sheep who shall wilfully refuse to give an inspector information as to the condition of sheep in his charge shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than twenty-five dollars nor more than two hundred and fifty dollars. In criminal actions against corporations under this act no arrests shall be necessary, but a summons, containing notice of the time and place of trial, together with a copy of the complaint, filed before a justice of the peace or in the court in which the action is commenced, shall be served in the same manner and for the same length of time as in civil actions.

SEC. 12. Actions may be brought for all misdemeaners defined in this act before any court having jurisdiction in the same. The provisions of this act requiring the sheep inspector to prosecute for violation of its provisions shall not be so construed as to prevent such prosecutions from being commenced and prosecuted by other persons as criminal actions are commenced and prosecuted in other cases.

SEC. 13. It shall be the duty of each sheep inspector to keep a book, in which he shall keep as nearly complete as practicable, a description of the marks and brands with which each person in his county marks or brands his sheep. The owners of the sheep shall report in writing to said inspector their marks and brands, and said books shall be delivered by the inspector at the end of his term of office to the clerk of the board of county commissioners, or to his successor in office.

SEC. 14. It shall be unlawful for any person, company, corporation, or association owning, controlling, or managing any ferryboat, toll bridge, car, steamboat, or other thing used for transportation, to allow any sheep to be carried thereon, unless the party in charge of said sheep shall first produce a certificate from an inspector appointed under this act or of every act amendatory to this, that said sheep are free from scab, scabies, and infectious and contagious disease; and any violation of this section shall be deemed a misdemeanor, and any person or persons, company or corporation violating the provisions of this section shall be fined not less than one hundred dollars nor more than two hundred and fifty dollars.

SEC. 15. If any person or persons, company or corporation, in driving or herding any sheep, should get into their herd any stray sheep, they shall immediately notify the owner thereof, or if the owner is unknown, he shall forthwith notify the sheep inspector thereof, giving the number of said sheep and the brands of each; and any person or persons, company or corporation, violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than twenty-five dollars nor more than two hundred and fifty dollars.

SEC. 16. All acts and parts of acts in conflict with this act are hereby repealed.

SEC. 17. In consequence of the rapid spread among sheep of contagious and infectious disease, and inasmuch as there is no adequate law for the protection of sheep growers, an emergency existing, therefore this act shall immediately take effect and become a law on and after its approval by the governor.

Approved March 2, 1893.

MAINE.

AN ACT to amend an act entitled "An act to extirpate contagious diseases among cattle."

Be it enacted by the senate and house of representatives in legislature assembled, as follows: Section one of chapter one hundred and seventy-seven of public laws of eighteen hundred and eighty-nine is hereby amended by striking out the words "and other live stock," in the fourth line, and inserting instead the words "horses and sheep," so that said section as amended shall read as follows:

"SECTION 1. That for the purpose of facilitating and encouraging the live-stock interests of Maine, and for extirpating all insidious, infectious, and contagious diseases now or that may be among cattle, horses, and sheep, and especially tuberculosis, the governor of the State is hereby authorized and required, immediately after the passage of this act, to appoint a board of cattle commissioners, consisting of three persons of known executive ability, who shall be charged with the execution of the provisions of this act, and who shall be known and designated as the State of Maine cattle commission, and whose powers and duties shall be those provided for in this act, and whose tenure of office shall be at the option of the governor. The compensation of said commissioners shall be at the rate of three dollars per day during the time they are actually engaged in the discharge of their duties as commissioners. The said commissioners shall respectively take an oath to faithfully perform the duties of their office, and shall immediately organize as such commission by the election of one of their number as president thereof, and proceed forthwith to the discharge of the duties devolved upon them by the provisions of this act."

SEC. 2. Section two of said act is hereby amended by striking out the word "two," in the twenty-ninth line, and inserting instead thereof the word "one;" and by striking out the words "one hundred," in the thirtieth and thirty-first lines, and inserting instead thereof the word "fifty;" also by striking out the word "one," in the thirty-six line, and inserting instead thereof the word "three;" also by inserting after the word "disease," in the thirty-seventh line, the words "and the owner or owners shall furnish satisfactory evidence as to the time such animal or animals shall have been owned in the State;" so that said section two as amended shall read as follows:

"SEC. 2. That it shall be the duties of the said commissioners to cause investigation to be made as to the existence of tuberculosis, pleuro-pneumonia, foot-and-mouth disease, and any other infectious or contagious disease. And such commissioners or their duly constituted agent are hereby authorized to enter any premises or places, including stock yards, cars, and vessels, within any county or part of the State in or at which they have reason to believe there exists any such diseases, and to make search, investigation, and inquiry in regard to the existence thereof. Upon the discovery of the existence of any of the said diseases the said commissioners are hereby authorized to give notice by publication of the existence of such disease, and the locality thereof, in such newspapers as they may select, and to notify in writing the officials or agents of any railroad, steamboat, or other transportation company doing business in or through such infected locality of the existence of such disease; and are hereby authorized and required to establish and maintain such quarantine of animals, places, premises, or localities as they may deem necessary to prevent the spread of any such disease, and also to cause the appraisal of the animal or animals affected with the said disease in accordance with such rules and regulations by them as hereinafter authorized and provided, and also to cause the same to be destroyed, and to pay the owner or owners thereof one-half of their value, as determined upon the basis of health before infection, out of any moneys appropriated by the legislature for that purpose: *Provided, however,* That no appraised value shall be more than one hundred dollars for an animal with pedigree recorded or recordable in the recognized herdbooks of the breed in which the animal destroyed may belong, nor more than fifty dollars for an animal which has no recordable pedigree: *Provided further,* That in no case shall compensation be allowed for an animal destroyed under the provisions of this act which may have contracted or been exposed to such disease in a foreign country, or on the high seas, or that may have been brought into this State within three years previous to such animals showing evidence of such disease, and the owner or owners shall furnish satisfactory evidence as to the time such animal or animals shall have been owned in the State; nor shall compensation be

allowed to any owner who, in person or by agent, knowingly and wilfully conceals the existence of such disease or the fact of exposure thereto in animals of which the person making such concealment, by himself or agent, is in whole or part owner."

Approved March 10, 1893.

MASSACHUSETTS.

AN ACT to codify and consolidate the laws relating to contagious diseases among domestic animals. (Chapter 491, acts of the year 1894.)

Be it enacted, etc., That the mayor and alderman of cities and the selectmen of towns shall, within thirty days after the passage of this act, and thereafter annually in the month of March, appoint one or more persons to be inspectors of animals and provisions. Each inspector shall be sworn faithfully to discharge the duties of his office, and shall receive a reasonable compensation, to be paid by the city or town for which he has been appointed. Such town and city officers shall have the power to remove any person so appointed by them to be an inspector, and in such case shall immediately appoint another in his place. Every city and town shall, within thirty days after the passage of this act, and thereafter before the first day of April in each year, send to the board of cattle commissioners a true and correct list of the duly appointed and qualified inspectors of animals and provisions appointed under this section, which notice shall give the name and address of each such inspector and his usual business occupation as far as the same is known.

SEC. 2. Whenever the officers of a city or town refuse or neglect to carry into effect the provisions of section one, such city or town shall be liable to forfeit a sum not exceeding five hundred dollars for each such refusal or neglect, and the board of cattle commissioners shall have the power to appoint one or more persons to be such inspector or inspectors for such city or town. Such board shall also have the power to remove any inspector of provisions and animals appointed under the provisions of this act whenever, in the opinion of said board, such inspector neglects or refuses to be sworn or properly perform the duties of his office, and in such case shall appoint another inspector to serve for the balance of his term. Every inspector of provisions and animals appointed by said board shall be sworn faithfully to discharge the duties of his office, and shall receive such compensation not exceeding the sum of five hundred dollars a year each, as said board shall determine. Such compensation shall be paid by the city or town for which he or they have been appointed.

SEC. 3. Every inspector appointed under the provisions of this act shall carry out and enforce all regulations and orders to him directed by the board of health under the provisions of this act, or by the board of cattle commissioners or any of its members, in the discharge of his or their duties.

SEC. 4. Said inspectors shall make regular and thorough inspections of all neat cattle found within the limits of their several cities and towns. Such inspections shall be made at such times and in such manner as the board of cattle commissioners shall from time to time determine and direct. They shall also make from time to time inspections of all other domestic animals within the limits of their several cities and towns whenever they have knowledge or reason to suspect that such animals are affected with or have been exposed to any contagious disease, and they shall immediately inspect any and all domestic animals whenever directed so to do by the board of cattle commissioners or any of its members.

SEC. 5. Every inspector shall keep a record of all inspections made by him and his doings thereon, and shall make regular returns of all such inspections to the board of cattle commissioners. Such records and returns shall be made in such form and at such times as the board of cattle commissioners shall determine and direct, and said board and the board of health of the city or town for which said inspector is appointed shall have at all times the right to inspect said records and make copies thereof.

SEC. 6. Whenever an inspector is satisfied, upon an examination of any neat cattle, that such cattle are free from contagious disease, he shall deliver to the owner or to the person in charge thereof a written certificate of their wholesome condition, signed by him, which certificate shall be in such form as the board of cattle commissioners shall prescribe, and shall cause a copy of said certificate to be entered upon his records.

SEC. 7. When any inspector, upon an examination of any domestic animal, suspects or has reason to believe that such animal is affected with a contagious disease, and whenever any inspector is directed so to do by the board of cattle commissioners or any of its members, or by the board of health of the city or town for which he has been appointed, he shall immediately cause said animal to be quarantined or isolated upon the premises of the owner or of the person in whose charge it is found, or in

such other place or enclosure as may be designated by either of such boards or any such commissioner, and shall take such other sanitary measures to prevent the spread of such disease as may be necessary or as shall be prescribed in such order or by any order or regulation issued by the board of cattle commissioners. Such inspector shall also deliver to the owner or person in charge of such animal, or to any person having an interest therein, a written notice or order of quarantine signed by him, which notice or order shall be in such form as the board of cattle commissioners shall prescribe, and he shall cause a copy of said notice to be entered upon his records.

SEC. 8. Such notice or order may be served by an officer authorized to serve civil process, or the same may be delivered by the inspector to the owner or person having such interest therein, or to the person in charge of such animal, or may be left at the last and usual place of abode of such owner or person, or may be posted upon the premises where said animal is quarantined or isolated, and a copy of said notice or order of quarantine, with the return of said officer or inspector thereon that such service has been made, shall be competent evidence in any court that such quarantine has been imposed. Whenever any animal has been quarantined by an inspector under the provisions of this act such animal shall remain in quarantine until the further order of the board of health of the city or town wherein said animal is confined, or of the board of cattle commissioners or any of its members.

SEC. 9. Whenever any inspector has caused any domestic animal to be quarantined, as provided in section eight, he shall immediately give a written notice thereof to the board of health of the city or town where said animal is quarantined, and shall also immediately send a written notice, together with a copy of the order of quarantine, to the board of cattle commissioners, and shall give such information to no other person.

SEC. 10. Said inspectors may inspect the carcasses of all slaughtered animals, and all meats, fish, vegetables, produce, fruits, or provisions of all kinds found in said cities or towns, and shall make such inspections thereof as may be ordered by the board of health for the city or town for which they have been appointed. Whenever the carcass of any such animal is, in the opinion of such inspector, diseased or unfit for food, or when such meat, fish, vegetables, produce, fruit, or provisions are found, on such inspection, to be tainted, diseased, corrupted, decayed, or unwholesome from any cause, such inspector shall seize the same and cause it or them to be destroyed forthwith or disposed of otherwise than for food; but if at the time of such seizure the owner of the property so seized notifies in writing the inspector seizing the same that he desires to appeal to the board of health of such city or town, such inspector shall retain the possession of such carcass, meat, fish, vegetables, produce, fruit, or provisions so seized, and shall immediately notify such board of health of such appeal, and it shall thereupon be the duty of such board of health or a committee thereof, consisting of not less than two members, to hear the parties or inspect such seized carcass, meat, fish, vegetables, produce, fruit, or provisions, and if, in the opinion of said board or said committee, the same is tainted, diseased, corrupted, decayed, or unwholesome, they shall order the same to be destroyed forthwith or to be disposed of otherwise than for food. If said board or committee do not so find they shall order said carcass, meat, fish, vegetables, produce, fruit, or provisions to be forthwith returned to the owner thereof. All moneys received by said inspectors or board of health for property disposed of as aforesaid shall, after deducting all expenses incurred by reason of said seizure, be paid to the owner of such property.

SEC. 11. Whenever such inspector seizes or condemns any such carcass or meat by reason of the presence of, or of its being affected with, any contagious disease, he shall immediately notify the board of cattle commissioners, giving the name of the owner or person in whose possession the said meat or carcass was found, the nature of the disease and the disposition made of said meat or carcass.

SEC. 12. Said inspectors may inspect all veal found in said city or town or offered or exposed for sale or kept with the intent to sell therein, and shall make such inspection whenever ordered so to do by the board of health of such city or town, and if said veal is, in the opinion of said inspector, that of a calf killed under four weeks old, he shall seize the same and cause it to be destroyed or disposed of as provided in the preceding section, subject, however, to the provisions therein contained concerning appeal and the disposal of moneys.

SEC. 13. For the purpose of inspecting or examining any animal, carcass, meat, fish, vegetables, produce, fruit, or provisions of any kind under the provisions of this act, any inspector, duly qualified, may enter into any building or buildings, or any part thereof, enclosure or enclosures, or other place where any such animal, carcass, meat, fish, vegetables, produce, fruit, or provisions of any kind are stored or kept, or exposed for slaughter or sale, and may examine or inspect the same. Any person who prevents, obstructs, or interferes with any such inspector or other person having the power and authority conferred upon inspectors under this section, in the performance of any of his duties as provided herein, or who shall hinder, obstruct, or interfere with his making any such inspection or examination, or who shall secrete

or remove any animal, carcass, meat, fish, vegetables, fruit, or provisions of any kind for the purpose of preventing the same from being inspected or examined under the provisions of this act, shall be subject to a fine not exceeding one hundred dollars, or to imprisonment in jail not exceeding sixty days, or by both such fine and imprisonment.

SEC. 14. When complaint is made on oath to any police, district, or municipal court, or any magistrate authorized to issue warrants in criminal cases, that the complainant believes that any diseased animal or carcass, or any tainted, diseased, corrupted, decayed, or unwholesome meat, fish, vegetables, produce, fruit, or provisions of any kind, or any veal of a calf killed under four weeks old, are kept or concealed in a particular building or place with the intent to kill, sell, or offer for sale for food the same or any product thereof, the court or magistrate, if satisfied there is reasonable cause for such belief, shall issue a warrant to search for such animals or articles, and all such warrants shall be directed and executed as provided in section three of chapter two hundred and twelve of the public statutes. If, upon hearing, said court or magistrate determines that any such diseased animal or carcass, or any such tainted, diseased, corrupted, decayed, or unwholesome article, or any of them, were kept or concealed for any of the purposes aforesaid, the same shall be destroyed or disposed of by an inspector appointed hereunder, or by an officer designated by the court or magistrate, and such disposal shall be in accordance with the provisions of section ten of this act. If the court or magistrate does not so determine, said animals or articles shall be returned to the owner.

SEC. 15. Whoever knowingly sells or offers or exposes for sale, or has in his possession with the intent to sell for food any diseased animal, or any product thereof, or any tainted, diseased, corrupted, decayed, or unwholesome carcass, meat, fish, vegetables, produce, fruit, or provisions of any kind, or the veal of a calf killed under four weeks old, shall be punished by imprisonment in jail not exceeding sixty days, or by a fine of not exceeding one hundred dollars, or by both such fine and imprisonment.

SEC. 16. The board of health for the city or town where any animal or property has been condemned under the provisions of sections ten and twelve of this act may cause to be published in two newspapers published in the county in which said property was found, a description of the place where such condemned property was found and the name of every person in whose possession the same was found, and may also cause to be published the name of every person convicted of an offence under section fifteen of this act.

SEC. 17. The proprietor or proprietors of every slaughterhouse, canning, salting, smoking, or rendering establishment, and of every establishment used for the manufacture of sausages or chopped meat of any kind, engaged in the slaughter of cattle, the carcass or any of the meat or product of which is to be sold or used for food, shall within thirty days after the passage of this act, and thereafter annually in the month of April, make application to the mayor and aldermen of the city or the selectmen of the town where such slaughterhouse or establishment is located for a license to carry on such business. Such application shall be in writing, signed by one or more of the owners thereof, or by one or more of the persons carrying on such business; if such owner or the person carrying on such business be a corporation, then by some officer thereof thereto duly authorized. Such application shall give the name in full and address of all the owners or persons carrying on said business, the location of the slaughterhouse or establishment where said business is to be conducted, shall state the estimated number of cattle to be slaughtered per week, the day or days of the week upon which it is intended to slaughter the same, and the nature of the product or products thereof to be sold or used for food. Every such application shall be sworn to before a justice of the peace.

SEC. 18. The mayor and aldermen of cities and the selectmen of towns, or such other board of officers as they shall designate, may annually issue to persons applying therefor licenses to carry on the business of slaughtering cattle, and there shall be paid to such city or town for every such license, by the person or persons obtaining the same, a fee of one dollar. Every such license shall name the person or persons licensed to conduct such business, the building or establishment where the same is to be carried on, and such license shall continue until the first day of May of the year next ensuing, or until sooner forfeited or rendered void. The board or officer of every city or town authorized to issue licenses hereby, shall keep a record of all applications for licenses under section seventeen, and shall record therein every license issued by him or them and such records shall be competent evidence in any court of the issue of any such license.

SEC. 19. No person or persons licensed under the preceding section shall slaughter or cause or authorize to be slaughtered at such slaughterhouse or establishment, except in the presence of an inspector, any cattle on any day or days other than those specified in the application for such license, except that such licensee may at any time change the day or days for slaughtering such cattle by giving at least seven days' written notice of such change to the board or person authorized to issue licenses

under the provisions of section eighteen; and such board or person shall immediately give written notice of such change to all inspectors appointed by such city or town.

SEC. 20. It shall be the duty of the inspectors of animals and provisions of the several cities and towns, or when there is more than one inspector appointed for any such city or town and any one of them has been duly selected and ordered so to do by the board of health of such city or town, then of such inspector so selected and ordered, to be present at all licensed slaughterhouses or establishments upon the day or days designated for slaughter in the application for such license, or at such other day or days as may be designated, under the provisions of section nineteen, and there carefully examine at the time of slaughter the carcasses of all cattle slaughtered thereat. And it shall be the duty of such inspectors also to examine at the time of slaughter any and all cattle slaughtered as provided in section twenty-one of this act, whenever notified so to do by the person slaughtering the same. Such inspection shall be made in such manner and under such rules and regulations as the board of cattle commissioners may from time to time determine and direct. Whenever, in the opinion of any inspector, any of said carcasses are diseased or any meat or product thereof is diseased, corrupted, unwholesome, or unfit for food, he shall seize the same and cause it to be destroyed, as provided in section ten of this act; subject, however, to the provisions therein contained concerning appeal and the disposal of money.

SEC. 21. None of the provisions of sections seventeen, eighteen, nineteen, and twenty of this act shall apply to the slaughter from time to time by any person not engaged in such business, as provided in section seventeen, of one or more of his own cattle, when the same are slaughtered upon his own premises other than a slaughterhouse or establishment mentioned in section seventeen, but such persons shall cause such carcass to be inspected at the time of slaughter by an inspector of animals and provisions appointed under the provisions of this act, unless said animal has been duly inspected under the provisions of this act within six months prior to such slaughter and a certificate of health has been delivered to the owner or person in charge thereof, as provided in section six.

SEC. 22. Any person violating any of the provisions of sections eighteen, nineteen, twenty, and twenty-one, or who, being engaged in the business of slaughtering cattle, shall slaughter any cattle or shall knowingly authorize or cause the same to be slaughtered with the intent of selling the carcass or any of the meat or product thereof for food, without first having applied for and obtained a license, as provided in sections seventeen and eighteen, or who, having obtained such license, slaughters or knowingly authorizes or causes to be slaughtered any cattle without causing the carcass thereof to be inspected, as provided in section twenty, or who sells, or authorizes or causes to be sold any carcass, meat or product of any cattle, knowing that such carcass, or the carcass from which such meat, or product was obtained, had not been inspected according to the provisions of sections twenty or twenty-one of this act, or who slaughters or knowingly authorizes or causes to be slaughtered any cattle upon his own premises other than a slaughterhouse or establishment mentioned in section seventeen, without causing the carcass of such animal to be inspected, except as provided in section twenty-one, or who sells, or authorizes or causes to be sold, the carcass or any meat or product thereof, of any such animal slaughtered upon his own premises, knowing that the same has not been inspected as provided in section twenty-one, shall be punished by a fine not exceeding five hundred dollars or by imprisonment in jail for not exceeding sixty days, or by both such fine and imprisonment.

SEC. 23. The conviction, under section twenty-two of this act, of any person licensed under the provisions of section eighteen shall itself render void the license to such person which is in force at the time of such conviction, and no new license shall be granted to such person for the balance of such term.

SEC. 24. The boards of health of cities and towns may take all measures necessary or expedient to suppress or prevent the spread or introduction of any contagious disease among the animals of their respective cities and towns and the immediate vicinity thereof, and for that purpose they may regulate or prohibit the passage from, to, or through their respective cities and towns, or from place to place within the same, of any animal or animals, and may prohibit their departure from any building or enclosure or exclude any such therefrom, and they may arrest or detain, at the cost of the owner or owners, any animal or animals found passing, contrary to such regulation or prohibition, or found to be within such prohibited enclosure, and may take all other necessary measures to enforce such regulations or probibitions.

SEC. 25. Such boards may from time to time make regulations in writing for their respective cities and towns for any of the purposes named in the preceding section. Such regulations may be general or may be restricted to particular animals, places, districts, persons, or class of persons. Such regulations shall be spread upon the records of their respective cities and towns, and shall be published therein in such

manner as may be provided in such regulations. A certified copy of all such regulations shall be immediately sent to the board of cattle commissioners.

SEC. 26. Said boards, in case of the existence of any contagious disease among domestic animals within the limits of their several cities and towns, and whenever directed so to do by the board of cattle commissioners or any of its members, shall cause the animals which are, or which they have good reason to believe are, infected with any contagious disease, or which are designated in such order, to be quarantined, secured, collected, or isolated in some suitable place or places within the limits of such city or town, and shall immediately give written notice thereof to the board of cattle commissioners. When any such animal or animals are quarantined, collected, or isolated upon the premises of the owner or person found in the possession thereof, written notice of such quarantine or isolation shall be given to such owner or person and be served, returned, and recorded in the same manner and with the same force and effect as is provided in sections seven and eight of this act.

SEC. 27. When any animals are quarantined, collected, or isolated under the provisions of this act upon the premises of the owner or of the person in possession thereof at the time such quarantine is imposed, the expense thereof shall be paid by such owner or person in possession, and when taken from such premises such expense shall be paid by the city or town wherein the animal is kept, and four-fifths of such payment, when certified by the treasurer of the city or town and approved by the board of cattle commissioners, shall be refunded by the Commonwealth.

SEC. 28. For all the purposes named in this act the boards of health of the several cities and towns shall have the same power and authority to appoint officers, agents, and assistants as are provided in sections ten and sixteen of chapter eighty of the public statutes; and when so appointed such officers, agents, and assistants shall be subject to all the provisions of law applicable to those appointed under the provisions of said sections. In the absence of any such appointment the inspectors appointed under sections one and two of this act shall be the agents of such boards for all purposes designated in this act.

SEC. 29. Every person, except the members of the board of cattle commissioners, who has knowledge or has good reason to suspect the existence of any contagious disease among any species of domestic animals within the limits of this Commonwealth, or that any domestic animal is affected with any such contagious disease, whether such knowledge is obtained by personal examination or otherwise, shall immediately give written notice thereof to the board of health of the city or town where such diseased animal or animals are kept, and for failure so to do shall be punished by a fine not exceeding five hundred dollars, or by imprisonment in jail not exceeding one year.

SEC. 30. Upon the receipt of such notice from any person other than a duly appointed inspector of animals and provisions for such city or town, such board of health shall forthwith cause such animal to be inspected by an inspector or by a competent veterinarian appointed by them for that purpose, and if upon such inspection such board or such inspector suspects, or has reason to believe, that contagion exists, he or they shall proceed according to the provisions of sections seven, eight, nine, and twenty-six of this act.

SEC. 31. A city or town whose officers refuse or neglect to carry into effect the provisions of sections twenty-four, twenty-five, twenty-six, and thirty of this act shall forfeit a sum not exceeding five hundred dollars for each day's neglect.

SEC. 32. All fines and forfeitures imposed upon cities or towns under sections two and thirty-one may be recovered by complaint or indictment to the use of the Commonwealth, or the same may be recovered in an action of tort, in the name of the board of cattle commissioners, to the use of the Commonwealth, and such complaint, indictment, or action may be maintained in any county.

SEC. 33. The boards of health of cities and towns, when in their judgment it is necessary to carry into effect the provisions of this act, may, within the limits of their respective cities and towns, take and hold for a term not exceeding one year any land without buildings, other than barns or stables, thereon, upon which to enclose, quarantine, and isolate any animals. They shall cause the damage sustained by any person in consequence of such taking and holding to be appraised by the assessors of the city or town wherein the land so taken is situated, and shall further, within thirty days after any such taking, cause to be entered upon the records of such city or town a description of such land sufficiently accurate for identification, together with the amount of the damages so appraised. The amount of said appraisement shall be paid by such city or town in such sums and at such times as the board of health may order. Any person aggrieved by such appraisement or order may, by an action of contract commenced at any time within three months after such taking, recover of the city or town wherein the land lies reasonable compensation for the damages so sustained by him. If, upon trial, the damages are increased beyond such appraisement, exclusive of interest, he shall recover his costs; otherwise, he shall pay costs. The Commonwealth shall reimburse to such city or town four-fifths of

the amount of such appraisal or judgment paid by such city or town, when certified by the treasurer of the city or town paying the same.

SEC. 34. Every animal quarantined or isolated by order of the board of cattle commissioners or any of its members, or by any board of health or inspector, in accordance with the provisions of this act, shall, during the continuance of such quarantine or isolation, be deemed to be affected with a contagious disease. Any person who shall knowingly break or authorize or cause to be broken any quarantine imposed under the provisions of this act, or who shall knowingly remove, authorize, or cause to be removed from any building, place, or enclosure where the same is quarantined or isolated, any animal contrary to such order of quarantine or isolation, or who shall knowingly place or cause or authorize to be placed any other animal or animals within a building, place, or enclosure where any animal or animals are quarantined, or in contact therewith, contrary to any order or notice of quaratine, or who shall knowingly conceal, sell, remove, or transport, or knowingly cause or authorize to be concealed, sold, removed, or transported, any animal, knowing or having reasonable cause to believe that such animal is affected with a contagious disease, or who shall knowingly authorize or permit any such animal to go at large upon any way, street, or highway within the limits of this Commonwealth, or who shall knowingly bring or authorize or permit to be brought from any other country, State, District, or Territory into this Commonwealth any animal that is affected with or has been exposed to any contagious disease, or who shall disobey any lawful order or regulation of any board of health or of any inspector in the discharge of his or their duty under the provisions of this act shall be punished by a fine not exceeding five hundred dollars or by imprisonment not exceeding one year, or by both such fine and imprisonment.

SEC. 35. Every person who kills or causes to be killed, with the consent of the owner or person in possession thereof, any animal, under suspicion that the same is affected with or has been exposed to a contagious disease, and who, upon the inspection of the carcass thereof, finds, or is of the opinion, that the same is affected with a contagious disease, shall notify such owner or person in possession thereof of the existence of such disease, and shall also immediately notify the board of cattle commissioners of the same, and of the place where the animal was found, the name of the owner or owners, or person or persons in possession thereof, and of the disposal made of such carcass. Any person violating the provisions of this section shall be subject to the same penalties as are provided in section fifteen of this act.

SEC. 36. The board of cattle commissioners created by chapter three hundred and seventy eight of the acts of the year eighteen hundred and eighty-five, shall hereafter consist of not more than five members, and the governor, with the advice and consent of the council, shall appoint two additional commissioners, one for the term of two years, and one for the term of three years, and upon the expiration of the term of office of any of said commissioners shall thereafter appoint a successor or successors for the term of three years. Said additional commissioners shall be subject to the provisions of said chapter three hundred and seventy-eight, so far as the same are applicable.

SEC. 37. Contagious diseases under the provisions of this act shall include glanders, farcy, contagious pluero-pneumonia, tuberculosis, Texas fever, foot-and-mouth disease, rinderpest, hog cholera, and rabies.

SEC. 38. The board of cattle commissioners shall have power to make from time to time orders and regulations concerning the extirpation, prevention, and suppression of contagious diseases among domestic animals, or concerning the destruction, care, and treatment of animals affected with, or which have been exposed to, any contagious disease. They shall further have, throughout the Commonwealth, all the power and authority herein conferred upon boards of health by sections twenty-four, twenty-five, twenty-six, and thirty-three of this act.

SEC. 39. The board of cattle commissioners shall from time to time make orders and regulations concerning the inspection and examination of animals, and the carcasses, meat, and product thereof; concerning the quarantine, killing, burial, and disposal of animals or carcasses affected with, or which have been exposed to, contagious disease, and concerning the cleansing and disinfecting of districts, buildings, or places where such contagion exists or has existed. Such board shall further from time to time make and prescribe forms of records of inspectors, certificates of examinations, notices and orders of quarantine, orders for killing and burial, and all returns to be made by inspectors and boards of health which are required or provided for under the provisions of this act.

SEC. 40. All orders and regulations made by the board of cattle commissioners under the provisions of this act shall be spread upon the records of such board, and a copy thereof shall be sent to each city or town to which the regulation or order applies, and shall be published by such board, or by the city or town to which they are directed, in such manner as such orders and regulations shall prescribe, or such orders or regulations may be directed to boards of health or inspectors; and in such

case a copy of the same shall be mailed to the board of health of every city or town included in such order, or to every known inspector appointed for the same. All orders and regulations made by the board of cattle commissioners under the provisions of this act shall supersede those made by the boards of health under sections twenty-four, twenty-five, and twenty-six hereof.

SEC. 41. The board of cattle commissioners may establish hospitals or quarantines, with proper accommodations, wherein, under prescribed regulations, animals by such commissioners selected may be confined and treated for the purpose of determining the varying characteristics of and the methods by which a specific contagion may be disseminated or destroyed, and they may direct boards of health and inspectors to enforce and carry into effect all such regulations as may from time to time be made for that end.

SEC. 42. The boards of health for the several cities and towns, and every inspector of animals and provisions appointed under the provisions of this act, shall carry out and enforce all lawful regulations, orders, and directions of the board of cattle commissioners or any of its members, to them or him directed, and any such officer or inspector who refuses or neglects to carry out the same shall be punished by a fine not exceeding five hundred dollars for every such offense.

SEC. 43. The board of cattle commissioners shall have the power and authority to appoint from time to time such officers, agents, and assistants as are necessary or expedient to carry out the purposes of this act, and to remove any and all of the same. All such officers, agents, and assistants shall have the power and authority conferred upon inspectors under the provisions of sections thirteen and fifty-seven hereof, and shall receive such compensation as such board shall determine.

SEC. 44. Each member of the board of cattle commissioners shall have throughout the Commonwealth all the power and authority conferred upon boards of health under section twenty-six of this act, and all the power and authority conferred upon inspectors of animals and provisions under sections four, six, seven, eight, ten, twelve, thirteen, and twenty of this act: *Provided, however*, That no appeal from any act done by any of said commissioners shall lie to the board of health, as provided in said sections ten, twelve, and twenty. Each such commissioner shall have the same power and authority to quarantine or isolate animals which have been exposed to a contagious disease, when, in his judgment, it is necessary or expedient so to do. Whenever any animal is quarantined or isolated by order of any of said commissioners, such quarantine or isolation shall continue until the further order of such commissioner of the board of cattle commissioners.

SEC. 45. When the board of cattle commissioners or any of its members, by an examination of a case of contagious disease among domestic animals, becomes satisfied that the public good requires it, such board or commissioner shall cause such animal or animals affected therewith to be securely isolated at the expense of the owner, or shall cause it or them to be killed without appraisal or payment. Such order of killing shall be in writing and may be directed to the board of health, inspector, or other person, and shall contain such direction as to the examination and disposal of the carcass, and the cleansing and disinfecting of the premises where such animal was condemned, as such board or commission shall deem expedient. A reasonable sum may be paid out of the treasury of the Commonwealth for the expense of such killing and burial. If it shall subsequently appear upon post-mortem examination, or otherwise, that such animal was free from the disease for which it was condemned, a reasonable sum therefor shall be paid to the owner thereof by the Commonwealth: *Provided, however*, That whenever any cattle afflicted with the disease of tuberculosis are killed under the provisions of this section, one-half of the value thereof at the time of slaughter for food or milk purposes, and without taking into consideration the existence of such disease, shall be paid to the owner thereof out of the treasury of the Commonwealth, if such animal has been within the State six months continuously prior to its being killed, provided such person shall not have, prior thereto, willfully concealed the existence of tuberculosis, or by act or willful neglect contributed to the spread of such disease.

SEC. 46. If the owner and the commissioner condemning the animal as affected with tuberculosis, under the provisions of section forty-five, can not agree as to the value of the animal so condemned, the question of such value shall be determined by three arbitrators, one to be selected by such commissioner, one to be selected by the owner, and the third to be selected by the two arbitrators first selected. Such board shall be sworn faithfully to discharge the duties of their office and shall determine the value of such animal according to the provisions of section forty-five, and one-half of the value so determined shall be paid to the owner, as provided in said section. Any person aggrieved by the doings under the provisions of section forty-five, or by the award of such arbitrators, may petition the superior court for the county where such animal was killed, or for the county of Suffolk, to have his damages assessed and paid. Such petition shall be against the board of cattle commissioners, and a copy thereof shall be served upon one of the commissioners in the same manner as

is provided for the service of other civil process. Such petition shall be filed in the clerk's office of the superior court for such county within thirty days after the killing of such animal or animals. Such petition shall be subject to the provisions of section sixty-nine of chapter one hundred and sixty-seven of the public statutes, and a trial may be had thereon at the bar of the court in the same manner as other civil cases are tried. If upon such trial it shall be determined that such animal was not affected with the disease for which it was condemned, reasonable compensation may be recovered therefor, and if the petitioner recover damages in excess of the amount previously awarded him by the arbitrators or allowed him by the commissioner, he shall recover his costs, otherwise he shall pay costs. The damages, costs, and expenses incurred by the commissioners in defending any such action shall be paid by the Commonwealth out of the fund appropriated for the cattle commissioners.

SEC. 47. Any person who fails to comply with a regulation made or an order given by the board of cattle commissioners, or any of its members, in the discharge of his or their duty, shall be punished by a fine not exceeding five hundred dollars or by imprisonment not exceeding one year.

SEC. 48. Prosecutions under sections thirteen, twenty-nine, thirty-four, thirty-five, forty-two, and forty-seven of this act shall be instituted and maintained in the county where the offense was committed.

SEC. 49. The commissioners may examine under oath all persons believed to possess knowledge of material facts concerning the existence or dissemination or danger of dissemination of contagious disease among domestic animals, and for this purpose shall have all the powers vested in justices of the peace to take depositions and to compel witnesses to attend and testify by chapter one hundred and sixty-nine of the public statutes. All costs and expenses incurred in procuring the attendance of such witnesses shall be allowed and paid to the commissioners from the treasury of the Commonwealth, upon being certified to and approved by the State auditor.

SEC. 50. When any animal or animals are killed by order of the board of cattle commissioners, or any of its members, the carcass or carcasses thereof may be inspected by such board or commissioner, or by a competent person by them or him appointed, and if found entirely free from disease and in a wholesome condition for food, the same may be sold by them or him or by their or his order, and the proceeds of such sale shall be applied in payment of the value of said animal or animals.

SEC. 51. The board of cattle commissioners shall keep a full record of their doings and report the same to the legislature on or before the tenth day of January in each year, unless sooner required by the governor, and an abstract of the same shall be printed in the annual report of the State board of agriculture.

SEC. 52. The board of cattle commissioners may appoint a clerk to keep the record of their doings, who shall receive such compensation, not exceeding the sum of five hundred dollars a year, as they shall determine.

SEC. 53. When animals are transported within this State from localities beyond its boundary lines, which localities the board of cattle commissioners deem to be infected, such animals may be seized and quarantined by the commissioners, at the expense of the owners or consignees thereof, so long as the public safety may require; and if, in their judgment, it is necessary to secure that safety, they may cause such animals to be killed without appraisal or payment for the same.

SEC. 54. No Texan, Mexican, Cherokee, Indian, or other cattle, which the cattle commissioners decide may spread contagious disease, shall be driven on the streets of any city, town, or village, or on any road in this Commonwealth, nor shall they be driven outside the stock yards connected with any railway in this Commonwealth contrary to any order of the board of cattle commissioners.

SEC. 55. In all stock yards within this Commonwealth, said Texan, Mexican, Cherokee, Indian, or other cattle, which the cattle commissioners decide may spread contagious disease, shall be kept in different pens from those in which other cattle are kept.

SEC. 56. Any person or persons violating any of the provisions of the two preceding sections shall be punished by a fine of not less than twenty nor more than one hundred dollars.

SEC. 57. Every cattle commissioner, member of a board of health, or inspector, shall have power to call on sheriffs, constables, and police officers to assist him, or them, in the discharge of the duties provided for in this act, and it is hereby made the duty of sheriffs, constables, and police officers to assist such commissioner, member, or inspector, when requested so to do, and he or they shall have the same powers and protection as peace officers while engaged in the discharge of his or their duties.

SEC. 58. Courts of equity in term time or vacation may, by injunction or other proper order, upon application of the board of cattle commissioners, enforce or restrain violations of the provisions of this act.

SEC. 59. Chapter fifty-eight of the public statutes, chapter two hundred and fifty-two of the acts of the year eighteen hundred and eighty-seven, chapters one hundred

and ninety-five and four hundred and thirty-two of the acts of the year eighteen hundred and ninety-two, chapter three hundred and six of the acts of the year eighteen hundred and ninety-three, and all other acts or parts of acts inconsistent herewith, are hereby repealed: *Provided, however,* That nothing herein contained shall affect any prosecution, action, or proceeding begun or pending, any penalty incurred, or any order or regulation issued, under any of said acts before this act takes effect: *And provided, further,* That all inspectors and agents appointed under any of such acts shall continue to hold office during the term for which they were appointed, unless sooner removed as provided by law, but they shall be subject to all the provisions of this act.

SEC. 60. The total expense incurred under the provisions of this act during the current year, including compensation for animals destroyed, shall not exceed fifty thousand dollars.

SEC. 61. This act shall take effect upon its passage.

Approved June 20, 1894.

NEW JERSEY.

A SUPPLEMENT to an act entitled "An act concerning contagious and infectious diseases among animals and to repeal certain acts relating thereto," approved May 4, 1886.

Whereas it is said that tuberculosis in cattle prevails in some sections of this State, whereby the health of our citizens is imperiled: Therefore,

SECTION 1. *Be it enacted by the senate and general assembly of the State of New Jersey,* That the president of the State board of agriculture shall appoint five persons, citizens and taxpayers of this State, who, together with himself and the secretary of the State board of agriculture, shall constitute a commission, who shall, at the request of two members of the State board of health or the State dairy commissioner or any owner of suspected animals, investigate the existence of tuberculosis, or cause the same to be investigated, and if any such disease is found to exist, to enforce such regulations in relation to the same as the said commission may adopt.

SEC. 2. *And be it enacted,* That when any animal or animals shall be slaughtered by direction of said commission, the value of the same shall be ascertained and appraised by three disinterested freeholders, resident in this State, who shall make and sign certificates thereof in the presence of a witness, who shall attest the same; such appraisement shall be made on the basis of the market value of the animal or animals slaughtered just prior to the time when they became so diseased, and shall be limited to the sum of one hundred dollars for registered animals and to forty dollars for all others; one-half of the valuation so ascertained shall be paid by the State on the presentation of such certificate, with the approval of the said commission indorsed thereon, to the owner or owners.

SEC. 3. *And be it enacted,* That it shall be the duty of said commission to keep a full and complete record of all their proceedings under this act and report the same annually to the State board of agriculture, and such a report shall be printed in and form a part of the annual report of the State board of agriculture.

SEC. 4. *And be it enacted,* That the sum of five thousand dollars is hereby annually appropriated to said commission to defray its expenses and the value of the cattle to be slaughtered by its direction: *Provided,* That no other compensation shall be allowed said commission than the expenses actually incurred in the execution of the duties hereby imposed.

SEC. 5. *And be it enacted,* That all bills for money expended under this act shall be audited by the comptroller of this State and then submitted to the governor for his approval; and after being thus audited and approved by the governor shall be paid by the State treasurer upon the warrant of the comptroller.

SEC. 6. *And be it enacted,* That this act shall be deemed a public act and shall take effect immediately.

Approved May 22, 1894.

NEW YORK.

AN ACT in relation to agriculture, constituting articles one, two, three, four, and five of chapter thirty-three of the general laws.

ARTICLE IV.

SEC. 60. *Suppression of infectious and contagious disease.*—Whenever any infectious or contagious disease except tuberculosis and glanders affecting domestic animals shall be brought into or break out in this State, the commissioner of agriculture

shall take measures to promptly suppress the same and to prevent such disease from spreading.

SEC. 61. *Commissioner to issue notice.*—He shall issue and publish a notice stating that a specified infectious or contagious disease exists in any designated county or other geographical district of the State, and warning all persons to seclude in the premises where they may be at the time all animals within such county and district that are of a kind susceptible to contract such disease, and ordering all persons to take such precautions against the spreading of the disease as the nature thereof may, in his judgment, render necessary or expedient, and which he may specify in such notice. Such notice shall be published in such newspapers and be posted in such manner as the commissioner may designate, and as, in his judgment, are most likely to give notice thereof.

SEC. 62. *Farms to be quarantined.*—The commissioner, or an assistant commissioner, shall order any premises, farm, or farms where such disease exists, or recently existed, to be put in quarantine, so that no domestic animal be removed from or brought to the premises or places quarantined, and shall prescribe such regulations as he may judge necessary or expedient to prevent the communication of the disease by infection or contagion in any way from the places so quarantined.

SEC. 63. *Detention and destruction of animals.*—The commissioner, or an assistant commissioner, may order all or any animals coming into the State to be detained at any place or places for the purpose of inspection and examination. He may prescribe regulations for the destruction of animals affected with infectious or contagious disease and for the proper disposal of their hides and carcasses, and of all objects which might carry infection or contagion. Whenever, in his judgment, necessary for the more speedy and economical suppression or prevention of the spread of any such disease, he may cause to be slaughtered, and to be afterwards disposed of, in such manner as he may deem expedient, any animal or animals which, by contact or association with diseased animals, or by other exposure to infection or contagion, may be considered or suspected to be liable to contract or communicate the disease sought to be suppressed or prevented.

SEC. 64. *Employment of veterinary surgeons.*—The commissioner may employ such and so many medical and veterinary practitioners, and such other persons as he may from time to time deem necessary, to assist him in discharging the duties imposed upon him by this article, and may fix their compensation. All persons now employed by the governor for such purposes shall continue in the employ of the commissioner upon the same terms until such employment shall be terminated or modified by the commissioner. No animal shall be destroyed by the commissioner, or by his order, on the ground that it is a diseased animal, unless first examined by a medical or veterinary practitioner in the employ of the commission under this section, nor until such practitioner renders a certificate to the effect that he has made such examination, that in his judgment such animal is affected with a specified infectious or contagious disease, or that its destruction is necessary in order to suppress or aid in suppressing such disease, or to prevent such disease, or to prevent the spread thereof, specifying the reasons for such necessity.

SEC. 65. *Regulations, and the enforcement thereof.*—The commissioner may prescribe such regulations as in his judgment may be thought suited for the suppression or prevention of the spread of any such disease, and for the disinfection of all premises, buildings, railway cars, vessels, and other objects from or by means of which infection or contagion may take place or be conveyed. He may alter or modify, from time to time, as he may deem expedient, the terms of all notices, orders, and regulations issued or made by him, and may at any time cancel or withdraw the same. He may call upon the sheriff or deputy sheriff to carry out and enforce the provisions of any notice, order, or regulation which he may make, and all such sheriffs and deputy sheriffs shall obey and observe all orders and instructions which they may receive from him in the premises.

SEC. 66. *Penalties.*—Any person violating, disobeying, or disregarding the terms of any notice, order, or regulation issued or prescribed by the commissioner under this article shall forfeit to the people of the State the sum of one hundred dollars for every such violation.

SEC. 67. *Expenses.*—All expenses incurred by the commissioner in carrying out the provisions of this article and in performing the duties herein devolved upon him shall be audited by the comptroller as extraordinary expenses of the department of agriculture, and paid out of any moneys in the treasury appropriated for such purposes.

SEC. 68. *Compensation to owners of animals destroyed.*—The actual value at the time they are killed of any animals slaughtered under the provisions of this article shall be paid to the owners of such animals. For the purpose of ascertaining and determining such value, the commissioner, or any agent appointed by him under this article, shall appoint one appraiser, the owner of the animals killed shall appoint another, and the two thus appointed shall select a third, and the three shall appraise

the amount to be paid to the owner of the animals. The board of claims shall have exclusive jurisdiction to hear, audit, and determine all claims which shall arise under the provisions of this article for compensation for animals slaughtered, and to allow thereon such sums as should be paid by the State. No compensation shall be made to any person who has wilfully concealed the existence of disease among his animals or upon his premises, or who in any way by act or by wilfull neglect has contributed to spread the disease sought to be suppressed or prevented.

SEC. 69. *Federal regulations.*—The commissioner of agriculture may accept, in behalf of the State, the rules and regulations prepared and adopted by the Commissioner of Agriculture or the Secretary or Department of Agriculture of the United States, under any act of Congress for the establishment of a bureau of animal industry or to prevent the exportation of diseased cattle or to provide means for the extirpation and suppression of pleuro-pneumonia and other contagious diseases among domestic animals, and shall cooperate with the authorities of the United States in the enforcement of the provisions of any such act.

SEC. 70. *Rights of Federal inspectors.*—The inspectors of the Bureau of Animal Industry of the United States shall have the right of inspection, quarantine, and condemnation of animals affected with any contagious, infectious, or communicable disease, or suspected to be so affected or that may have been exposed to any such disease, and for such purposes they may enter upon any ground or premises; they may call the sheriffs, constables, and peace officers to assist them in discharge of their duties in carrying out the provisions of any such act; and all sheriffs, constables, and peace officers shall assist such inspectors when so requested, and such inspectors shall have the same powers and protection as peace officers while engaged in the discharge of their duties. This State shall not be liable for any damages or expenses caused or made by such inspectors.

* * * * * *

SEC. 91. This chapter shall take effect immediately.

Approved by the governor April 10, 1893.

AN ACT to amend the agricultural law and the penal code relative to violations of the same.

The people of the State of New York, represented in senate and assembly, do enact as follows:

SECTION 1. Section twenty-six of the agricultural law is amended as follows:

"SEC. 26. *Manufacture and sale of imitation butter prohibited.*—No person, by himself, his agents, or employés, shall produce or manufacture out of or from any animal fats or animal or vegetable oils not produced from unadulterated milk, or cream from the same, any article or product in imitation or semblance of natural butter produced from pure, unadulterated milk or cream of the same; nor shall any person solicit or take orders for the same, or offer the same for sale, or mix, compound with or add to milk, cream, or butter any acids or other deleterious substance, or any animal fats or animal or vegetable oils not produced from milk or cream, so as to produce any article or substance or any human food in imitation or in the semblance of natural butter, nor sell, keep for sale, or offer for sale any article, substance, or compound made, manufactured, or produced in violation of the provisions of this section, whether such article, substance, or compound shall be made or produced in this State or elsewhere."

SEC. 2. Section four hundred and eight-a of the Penal Code is amended as follows:

"SEC. 408*a*. *Violations of agricultural law.*—Any person who disregards, disobeys, or violates any proclamation, notice, order, or regulation, lawfully issued or prescribed by the Commissioner of Agriculture for the suppression or prevention of the spread of infectious or contagious diseases among domestic animals, or who violates any of the provisions of sections eighty and eighty-two of article five of the agricultural law, is guilty of a misdemeanor; every person who violates any of the provisions of article two of said chapter is guilty of a misdemeanor, and shall be punished by a fine of not less than twenty-five dollars nor more than two hundred dollars, or by imprisonment of not less than one month nor more than six months, or by both such fine and imprisonment, for the first offense, and by six months' imprisonment for the second offense; and any person who violates any of the provisions of article three of said chapter is guilty of a misdemeanor, and shall be punished by a fine of not less than fifty dollars nor more than one hundred dollars."

SEC. 3. This act shall take effect immediately.

Approved May 3, 1894.

OREGON.

AN ACT to amend an act entitled "An act to prevent the spread of contagious animal diseases," approved February 25, 1889.

Be it enacted by the legislative assembly of the State of Oregon,

SECTION 1. That section 6 of an act entitled "An act to prevent the spread of contagious animal diseases," approved February 25, 1889, be, and the same is hereby, amended so as to read as follows:

"SEC. 6. That it shall be the duty of said State veterinarian, upon receipt of such information from a stock inspector of any county that any contagious or infectious disease does exist, to immediately examine, or deputize a competent person to examine, all animals reported to be diseased, and if he finds that such animals are infected with a contagious or infectious disease, he shall promptly take such measures as he may deem expedient and necessary to prevent the spread of the disease; he shall also immediately notify the commission of his actions, which shall be subject to the approval of the commission, who shall subsequently instruct him how to proceed, and prescribe such rules and regulations as in their judgment the exigencies of the case may require for the effectual suppression and eradication of the disease; and for that purpose the State veterinarian may list and describe the domestic animals affected with such disease, and those which have been exposed thereto and included within the infected district or premises so defined and quarantined, with such reasonable certainty as would lead to their identification; and no domestic animal liable to become infected with the disease, or capable of communicating the same, shall be permitted to enter or leave the district, premises, or grounds quarantined except by the authority of the commission. When, in the opinion of the commission, it shall be necessary to prevent the spread of contagious or infectious disease among the live stock of the State, to destroy animals affected with, or which have been exposed to any such disease, it shall be determined what animals shall be killed, and appraise the same as hereinafter provided and cause the same to be killed and the carcasses disposed of as in their judgment will best protect the health of domestic animals of the localities. When, in the opinion of the commission, any of the live stock of the State are infected with tuberculosis, the commission shall have the power to instruct and authorize the State veterinarian to apply to such animals as are suspected of having tuberculosis the 'tuberculin' test."

Passed by the senate February 4, 1895.

Passed by the house February 22, 1895.

AN ACT to repeal an act entitled "An act to amend section 3 of an act approved February 25, 1889, entitled 'An act to amend section 3350, section 3351, section 3353, section 3354, and section 3362, and to repeal section 3359 and section 3360 of Title I of Chapter XXXVIII of the Miscellaneous Laws of Oregon, as compiled and annotated by William Lair Hill,'" approved February 18, 1891, and to amend section 3352 and sections 3353 and 3354 of the Laws of Oregon, as compiled and annotated by William Lair Hill.

Be it enacted by the legislative assembly of the State of Oregon, That an act entitled "An act to amend section 3 of an act approved February 25, 1889, entitled 'An act to amend section 3350, section 3351, section 3353, section 3354, and section 3362, and to repeal section 3359 and section 3360 of Title I of Chapter XXXVIII of the Miscellaneous Laws of Oregon, as compiled and annotated by William Lair Hill,'" approved February 18, 1891, be, and the same is hereby, repealed.

SEC. 2. That section 3352 of the Laws of Oregon, as compiled and annotated by William Lair Hill, be, and the same is hereby, amended so as to read as follows: "SEC. 3352. Any person, company, corporation, or association desiring to move his or their sheep which are not sound or are infected or affected with scab or any infectious or contagious disease shall obtain from the inspector a traveling permit; but such permit shall only be granted for the purpose of moving said sheep to the nearest place where they may be treated for said disease, and by such route as the inspector may designate. Any person, company, or corporation violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than fifty nor more than five hundred dollars; and any party injured or damaged by the reason of the moving of said sheep shall be entitled to recover off of said person, company, or corporation, by a civil action, three times the amount of damages, direct and consequential, that said party has actually sustained by reason thereof."

SEC. 3. That section 3353 of the Laws of Oregon, as compiled and annotated by William Lair Hill, be, and the same is hereby, amended so as to read as follows: "SEC. 3353. Whenever, upon examination of any herds or bands of sheep, kept or herded

within any county of the State of Oregon, the stock inspector of such county shall find such band or herd of sheep, or any portion of them, infected with scab or scabies, or any contagious or infectious disease, it shall be his duty forthwith to take charge of such herd or band of sheep and keep the same from contact with other sheep until he has cured them of such contagious or infectious disease, giving notice in writing to the owner or person in charge of such herd or band of infected sheep that he has so taken possession, the reason therefor, and the place where such sheep shall be kept until cured of the disease with which they may be infected. Immediately upon taking possession of any band or herd of sheep, as provided in the foregoing section, the inspector shall proceed to apply to such infected band or herd of sheep proper remedies for the cure of the disease of which such sheep may be infected. If said sheep are infected with scab or scabies, he shall, within fifteen days from the date of taking possession of such sheep, thoroughly dip said sheep with a dip of recognized virtue in the cure of such disease, such dip to be selected by the inspector and applied under his direction; and he shall thereafter, at least once and as many more times as may be necessary to effect a cure of said disease, dip said sheep thoroughly, as provided in this section, with an interval between the dippings of not less than twelve nor more than seventeen days. And when cured of such infectious disease, the inspector shall so notify the owner or person in possession thereof at the time the inspector took possession of such diseased sheep. Such inspector shall then quarantine all the corrals, pastures, and ranges in which they have been confined or herded upon since they were first discovered to be affected with such contagious disease, by closing such corrals and posting a notice thereon warning the public of the infection therein and to refrain from occupying such corrals with bands or herds of sheep for a period of not less than three nor more than nine months, under penalty as hereinafter specified, and by posting two notices in two conspicuous places upon such range or pasture, warning the public of the infection thereon and to refrain from pasturing or herding thereon for a period of not less than thirty nor more than ninety days thereafter, under penalty as hereinafter specified.

"Any person or persons who shall confine any sheep in any corral or pasture or herd upon any range while under quarantine shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than fifty nor more than two hundred and fifty dollars. All expenses incurred by the stock inspector in the performance of his official duties as above specified, including the expenses incurred in taking possession of any infected band of sheep, the care of the same, the remedies used and the expense of applying the same, the wages of assistants employed, compensation of said inspector at the rate of ($3.00) three dollars per day for such day or part thereof in which he may be engaged in attending to the dipping of such sheep, shall become a lien upon said sheep, and the inspector shall hold the sheep until the same is paid; or if it be not paid within ten days after notice of cure of said disease as herein provided, the inspector may, after ten days' advertisement thereof in some newspaper of general circulation in the county wherein such sheep are, proceed to sell such sheep, or as many thereof as may be necessary, in the manner provided by law for the sale of personal property under execution, and from the proceeds of such sale he shall pay all charges incurred under the terms of this act, together with the expenses of advertising and sale of such sheep, and shall render the surplus, if any, to the owner or person in lawful possession of such sheep, taking his receipt therefor for any and all sheep returned to him after such sale."

Stock inspectors, in enforcing this act, shall take into consideration the condition of the weather, the lambing period of sheep, and shall observe the conditions thereof as follows: "He shall not dip any band or herd of sheep, or any part thereof, when the weather is of such severity as to endanger the lives of the same by so dipping; he shall not dip any band of ewes, or any part of them in which there are ewes with lambs, at any time from the first of March to the first of May of any year; that in Lake County he shall not dip any ewes with lambs, from the first day of April to the first day of June. Between the first day of January and the first day of May in each year, all sheep being then west of the Cascade range of mountains in Oregon, shall be exempt from the provisions of this act. Any stock inspector who, having taken into his possession any band or herd of sheep as by this act provided, shall by gross negligence or malfeasance in office cause the owner or owners thereof to sustain damage shall be, together with his sureties, liable for all damage sustained by reason of such gross negligence or malfeasance in office, together with all costs in collecting the same, which shall be recovered in a civil action before any court having jurisdiction thereof, and the proceedings shall be the same in all respects as in other civil actions."

SEC. 4. That section 3354 be amended so as to read as follows: "SEC. 3354. The stock inspector of the several counties of this State shall receive the following annual salaries for their services, to be paid quarterly by their respective counties, to wit: Of Baker County, four hundred dollars; of Benton County, twenty-five

dollars; of Clatsop County, twenty-five dollars; of Coos County, twenty-five dollars; of Columbia County, twenty-five dollars; of Crook County, eight hundred dollars; of Curry County, two hundred dollars; of Douglas County, one hundred dollars; of Gillian County, five hundred dollars; of Grant County, eight hundred dollars; of Harney County, three hundred and fifty dollars; of Jackson County, two hundred dollars; of Josephine County, twenty-five dollars; of Klamath County, one hundred dollars; of Lake County, eight hundred dollars; of Lane County, twenty-five dollars; of Linn County, twenty-five dollars; of Marion County, twenty-five dollars; of Morrow County, eight hundred dollars; of Multnomah County, twenty-five dollars; of Malheur County, five hundred dollars; of Polk County, twenty-five dollars; of Sherman County, three hundred dollars; of Tillamook County, twenty-five dollars; of Umatilla County, four hundred dollars; of Union County, eight hundred dollars; of Wasco County, eight hundred dollars; of Wallowa County, three hundred dollars; of Washington County, twenty-five dollars; of Yamhill County, twenty-five dollars; but the county courts of the respective counties may, in their discretion, when sitting for the transaction of county business, increase or decrease the salaries of such inspectors in their respective counties. The inspectors shall also be allowed to collect a fee of three dollars per day for every day or part of a day in which he shall be engaged in inspecting sheep for the purpose of granting traveling permits or certificates of soundness, together with ten cents per mile for the distance necessarily traveled by him in making such inspections, except at semiannual inspections: *Provided*, That no person, company, or corporation owning or controlling any band or bands of sheep, and holding a certificate of soundness issued by the inspector of the proper county within thirty days of such time as such person, company, or corporation shall desire to move said band or bands of sheep, shall be required to have a traveling permit for the purpose of moving said sheep from one locality to another within the county in which such sheep are located. Any inspector at any time granting a permit to allow any stock to travel without first having examined said stock shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than one hundred dollars nor more than two hundred and fifty dollars; and for any violation or a failure on the part of any inspector of stock to comply with any of the requirements of this act, it is hereby made the duty of the respective district attorneys of the counties where such inspector may reside to forthwith institute, in the name of the State of Oregon, action upon his official bond against said inspector and his sureties for the enforcement therein provided for."

SEC. 5. All acts and parts of acts in conflict with the provisions of this act be, and the same are hereby, repealed.

Filed in the office of the secretary of state February 21, 1893.

TEXAS.

AN ACT to provide for the protection of domestic animals, for the creation of a live stock sanitary commission, for the establishing of live stock quarantine lines, rules, and regulations; to provide penalties for violating the same, and to make an appropriation to carry out the provisions of this act.

SECTION 1. *Be it enacted by the legislature of the State of Texas*, That there shall be appointed by the governor, and with the consent of the senate, a live stock sanitary commission of the State of Texas, composed of three members. Before entering upon the duties of their office said commissioners shall take and subscribe to the usual oath of office and file the same with the secretary of state; and they shall also, before entering upon the performance of their duties, execute a bond, to be approved by the state comptroller, in the sum of ten thousand dollars each, conditioned that they will faithfully perform the duties of their office, which said bond they shall file with the secretary of state. The term of office of said commissioners shall be for a period of two years next from the day of their qualification, and until their successors shall have been appointed and qualified.

SEC. 2. The commissioners whose appointment is provided for in the preceding section shall each be practical live-stock raisers in the State of Texas, and shall have been actively engaged in said business for at least five years next preceding the date of their appointment, and shall be bona fide residents of and stock raisers in the particular section of the State from which they may be appointed. One of said commissioners shall be appointed from the west, one from the south, and one from the eastern portion of said State.

SEC. 3. It shall be the duty of the commission provided for in the first section of this act to protect the domestic animals of this State from all contagious or infectious diseases of a malignant character, whether said diseases exist in Texas or elsewhere; and for this purpose they are hereby authorized and empowered to establish, maintain, and enforce such quarantine lines and sanitary rules and regulations as they

may deem necessary. It shall also be the duty of said commission to cooperate with live stock quarantine commissioners and officers of other States and Territories, and with the United States Secretary of Agriculture in establishing such interstate quarantine lines, rules, and regulations as shall best protect the live-stock industry of this State against Texas or splenetic fever. It shall be the duty of said commission, upon receipt by them of reliable information of the existence among the domestic animals of the State of any malignant disease, to go at once to the place where any such disease is alleged to exist, and make a careful examination of the animals believed to be affected with any such disease, and ascertain, if possible, what, if any, disease exists among the live stock reported to be affected, and whether the same is contagious or infectious, and if said disease is found to be of a malignant, contagious, or infectious character, they shall direct and enforce such quarantine lines and sanitary regulations as are necessary to prevent the spread of any such disease. And no domestic animal infected with disease, or capable of communicating the same, shall be permitted to enter or leave the district, premises, or grounds so quarantined, except by authority of the commissioners. The said commission shall also, from time to time, give and enforce such directions and prescribe such rules and regulations as to separating, feeding, and caring for such diseased and exposed animals as they shall deem necessary to prevent the animals so affected with such disease from coming in contact with other animals not so affected. And the said commissioners are hereby authorized and empowered to enter upon any grounds or premises to carry out the provisions of this act.

SEC. 4. When the commission shall have determined the quarantine lines and other regulations necessary to prevent the spread among domestic animals of Texas of any malignant, contagious, or infectious disease found to exist among the live stock of this State, or elsewhere, and given their orders as hereinbefore provided, prescribing quarantine and other regulations, they shall notify the governor of the State of Texas, who shall issue his proclamation, proclaiming the boundary of such quarantine around such diseased stock, and the orders, rules, and regulations prescribed by the commission; and such commission shall give such notice as may to them seem best to make the quarantine established by them effective.

SEC. 5. The commission provided for in this act shall have power to purchase such supplies and material as may be necessary to carry into full effect all orders by them given, as hereinbefore provided, which said supplies and material and wages and expenses of the veterinarian hereinafter provided for shall be paid out of the moneys hereinafter appropriated, on the warrant of the comptroller, issued to said commissioners upon their filing with the Comptroller an itemized account thereof, properly verified by affidavit: *Provided*, That no material or supplies may be purchased by the commissioners except such as may be necessary to carry into effect the quarantine and other regulations prescribed by them. And such commissioners shall have the power to employ a competent veterinarian to assist them in the investigation of the diseases amongst the live stock of this State whenever they may deem the services of one necessary: *Provided*, That the compensation of such veterinarian shall not exceed the sum of ten dollars per day and actual expenses while so employed: *And provided further*, That the expenditures for the compensation of veterinarians shall not exceed nine hundred dollars in any one year.

SEC. 6. It shall be the duty of the railway corporations doing business in the State to cleanse and disinfect the cars used by them in transporting live stock in or through this State at such times and places as the commissioners may designate, whenever in the opinion of the commissioners any such order may be necessary to prevent the spread of infectious or contagious disease. Any such corporations violating the provisions of this section shall be liable to a penalty of five hundred dollars for each offense, to be recovered in a civil action, to be prosecuted under the direction of the attorney-general in the name of the State of Texas.

SEC. 7. It shall be the duty of any owner or person in charge of any domestic animal or animals, who discovers, suspects, or has reason to believe that any of his domestic animals, or domestic animals in his charge, are affected with any contagious or infectious disease, to immediately report such fact, belief, or suspicion to the commission and to the sheriff and county clerk of the county in which said domestic animals are found.

SEC. 8. Any person who shall knowingly bring into this State any domestic animal which is infected with any contagious or infectious disease, or any animal which has been exposed to any contagious or infectious disease, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than five hundred nor more than five thousand dollars.

SEC. 9. Any person who owns or is in possession of live stock, which is reported to be affected with any infectious or contagious disease, who shall refuse to allow the State live stock sanitary commissioners to examine such stock, or shall hinder or obstruct the said commissioners in any examination of, or in any attempt to examine such stock, shall be deemed guilty of a misdemeanor, and upon conviction thereof

shall be fined in any sum not less than one hundred dollars nor more than five hundred dollars.

SEC. 10. Any person who shall have in his possession any domestic animal affected with any contagious or infectious disease, knowing such animal to be affected, who shall permit such animal to run at large, or who shall keep such animal where other domestic animals, not affected by or previously exposed to such disease, may be exposed to its contagion or infection, or who shall ship, drive, sell, trade, or give away such diseased animal or animals which have been exposed to such infection or contagion, or who shall move or drive any domestic animal in violation of any direction, rule, regulation, or order of the live stock sanitary commission of Texas establishing and regulating live stock quarantine, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than one hundred dollars nor more than five hundred dollars for each of such exposed or diseased domestic animals which he shall permit to run at large, or sell, ship, drive, trade, or give away in violation of the provisions of this act: *Provided*, That any owner of domestic animal which has been affected with or exposed to any contagious or infectious disease may dispose of the same, after having obtained from the State live stock sanitary commissioners a bill of health for such animal or animals.

SEC. 11. The commissioners appointed by the governor, as hereinbefore provided, shall receive five dollars per day for the time by them necessarily employed in the discharge of the duties required by this act; and said commissioners hereinbefore provided for shall receive in addition thereto the actual and necessary traveling expenses incurred by them and paid in the discharge of the duties required of them by the provisions of this act; which said per diem and expenses shall be drawn from the treasury on the warrant of the comptroller, to be issued to said commissioners on their filing with the comptroller an itemized account thereof, properly verified by affidavit.

SEC. 12. The live stock sanitary commission shall have power to call upon any sheriff, deputy sheriff, or constable to execute their orders, and such officers shall obey the orders of said commissioners; and the officer or officers performing these duties shall each be entitled to two dollars and fifty cents per day for himself and horse, which payment shall be made upon a sworn account, approved by said commissioners: *Provided*, That said expenses under this section shall not exceed in any event five hundred dollars per annum.

SEC. 13. Except as otherwise provided in this act, any person who shall violate, disregard, or evade, or attempt to violate, disregard, or evade, any of the provisions of this act, or who shall violate, disregard, or evade, or attempt to violate, disregard, or evade, any of the rules, regulations, orders, or directions of the live stock sanitary commission, establishing and governing quarantine, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than one hundred nor more than five thousand dollars.

SEC. 14. The sum of twenty thousand dollars, or so much thereof as may be necessary, is hereby appropriated, out of the general revenue fund not otherwise appropriated, for the purpose of carrying into effect the provisions of this act: *Provided*, That the exhaustion of the appropriation herein made shall terminate the liability of the State for the two years next following, and absolve it from any future claims of any and all persons who may have claims, real or pretended, under the provisions of this act.

SEC. 15. Any quarantine line that may be fixed by the live stock sanitary commission, against Texas or splenetic fever, shall be so fixed as to conform to the Federal quarantine line established, or that may be established, by the United States Department of Agriculture: *Provided, however*, That as to the shipment or movement of live stock within the limits of the State, such quarantine lines, and the regulations in relation thereto, shall not apply from the 1st day of November to the 15th day of May of each year: *Provided*, The quarantine line now recognized and established by Federal authority within the State of Texas shall not be changed prior to December 1, 1893, but said line as is now established shall remain in full force until said date.

SEC. 16. No quarantine line shall be established at any time, nor regulations made in relation thereto, unless two of the live stock sanitary commissioners agree thereto.

SEC. 17. This act does not repeal any law in force for the protection of domestic animals, but is cumulative thereto.

SEC. 18. Whereas there is now no existing live stock quarantine law in the State of Texas, and whereas the people of this State, engaged in the honorable occupation of raising live stock, are now subject to harsh and severe Federal quarantine laws and regulations, which greatly depreciate the value of live stock in this State, creates an emergency, and an imperative public necessity and emergency exist requiring that the constitutional rule requiring bills to be read on three several days in each house be suspended, and it is hereby suspended.

Approved April 20, A. D. 1893.

VERMONT.

AN ACT to amend sections four thousand and twenty-one, four thousand and twenty-two, and four thousand and twenty-three of the revised laws.

It is hereby enacted by the general assembly of the State of Vermont, SECTION 1. Section 4021 of the revised laws is hereby amended so as to read as follows, viz: "When bovine tuberculosis or any contagious disease exists in the State among cattle or other domestic animals the board of agriculture may quarantine all infected animals, or such as they suppose have been exposed to the contagion; may prohibit any animal from passing on or over any of the highways near the place of quarantine; may enter upon any premises where there are animals suspected to have bovine tuberculosis or any contagious disease; may employ such expert help and means as they deem necessary to a thorough investigation of such diseases; may make all investigations and regulations they deem necessary for the detection, prevention, treatment, cure, and extirpation of such disease, but shall not apply the tuberculin test without the consent of the owner of the cattle, but in quarantine regulations against cattle imported from without the State the tuberculin test may be applied; and they may condemn and order killed any cattle or other domestic animals believed by said board to be infected with bovine tuberculosis or any contagious disease, and may order the bodies of the same buried or burned, as in their judgment the case may require; may forbid the sale or removal from the premises of any dairy product from cows that are believed to have bovine tuberculosis. Any person who shall knowingly violate or refuse to comply with any order or regulation of such board, made under the authority of this section, shall be fined not more than two hundred dollars, or be imprisoned not more than two years, or both."

SEC. 2. Section 4022 of the revised laws is hereby amended so as to read as follows: "If any person shall sell or offer to sell any cattle or other domestic animals known to him to be infected with bovine tuberculosis or any contagious disease, or any disease dangerous to the public health, or shall sell or offer to sell any part or parts of such cattle or other domestic animals, he shall be fined not more than two hundred dollars or be imprisoned not more than two years, or both."

SEC. 3. The value of all cattle or other domestic animals, killed by the written order of the board of agriculture shall be appraised by one of said board and a disinterested person selected by the owner of the condemned animals; but if these two can not agree upon the amount of the appraised value of the animals, they shall select a third disinterested person, who, together with them, shall appraise the animal, such appraisal to be made just before killing, and on a basis of health. The limit of the appraisal of cattle shall be forty dollars. A post-mortem examination shall be made, and if the animal be found affected with bovine tuberculosis, or any disease dangerous to the public health, the owner of the animal shall receive one-half the appraised value; but if no bovine tuberculosis or disease dangerous to the public health be found, the owner of the animal shall receive the full amount of the appraisal, and in addition shall receive the slaughtered animal. The amount which the owner is entitled to receive shall be paid by the State to the owner of such animal or animals upon a written order, signed by the member of the board in charge, and countersigned by the secretary of said board. No indemnity shall be paid to the owner of condemned cattle or other domestic animals that have not been owned and kept in the State for at least six months previous to the discovery of the disease. Any person who shall knowingly violate, or refuse to comply with any regulations made by such board of agriculture, under the authority and provisions of this section, shall be fined not more than two hundred dollars or imprisoned not more than two years, or both.

SEC. 4. All expenses incurred by the board under the provisions of this act shall be allowed by the State auditor, upon the approval of the governor, and be paid by the State.

Approved November 27, 1894.

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